

**CREATING A CLIMATE RESILIENT AMERICA:
OVERCOMING THE HEALTH RISKS
OF THE CLIMATE CRISIS**

HEARING
BEFORE THE
**SELECT COMMITTEE ON THE
CLIMATE CRISIS**
HOUSE OF REPRESENTATIVES
ONE HUNDRED SIXTEENTH CONGRESS
SECOND SESSION

HEARING HELD
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CREATING A CLIMATE RESILIENT AMERICA: OVERCOMING THE HEALTH RISKS OF THE CLIMATE CRISIS

WEDNESDAY, FEBRUARY 5, 2020

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE ON THE CLIMATE CRISIS,
Washington, DC.

The committee met, pursuant to call, at 9:03 a.m., in Room 1300, Longworth House Office Building, Hon. Kathy Castor (chairwoman of the committee) presiding.

Present: Representatives Castor, Bonamici, Brownley, Huffman, Levin, Graves, Palmer, Carter, and Miller.

Ms. CASTOR. Committee will come to order. Welcome to the February 5th, 2020, meeting of the Select Committee on the Climate Crisis, "Creating a Climate Resilient America: Overcoming the Health Risks of the Climate Crisis."

Without objection, the chair is authorized to declare a recess of the committee at any time.

Good morning, and thanks to everyone for being here early this morning. I hope the state of your coffee is strong this morning. Today we are continuing to investigate the challenges posed by the climate crisis and the benefits we gain from solving it. Health issues are top of mind for many Americans, and the serious health consequences of climate change should be too. This hearing will examine how climate solutions help save lives and provide economic benefits. I will now recognize myself for 5 minutes for an opening statement.

The climate crisis is making air pollution worse, and as temperatures rise, the public health suffers. Today we will explore the harms of the growing health impacts related to the climate crisis and what we can do about it. One of our most important responsibilities as elected representatives is to keep our constituents safe. Congress has worked to keep Americans healthy whether it is by protecting our drinking water, investing in life-saving medical research, or expanding access to healthcare. And while America has been fueled over the past two centuries by burning coal, oil, and gas, over time, those fuel sources have harmed the public health, and now it is getting worse. The number and gravity of cases of heart and lung disease, asthma, extended allergy seasons, and the impacts of extreme heat are on the rise.

And climate-aggravated illnesses are having a disproportionate impact on children, seniors, and our neighbors who work outside. The science could not be clearer: The climate crisis is making

Americans sicker, exposing them to stronger heat waves, dangerous wildfires, floods, droughts, and climate-fueled disasters, the changing climate is also altering the patterns of infectious diseases making warm seasons longer and threatening food security across the world. Unless we take bold climate action, global surface temperatures will continue to rise, making these risks even more dangerous. But science tells us that we can do something about it. We can reduce carbon pollution, increase energy efficiency, and move toward a clean energy economy. We can strengthen clean air and clean water protections and we can solve this crisis by taking bold, urgent action to protect the health of all Americans. Curbing pollution can literally save lives and save America hundreds of billions of dollars.

The World Health Organization estimates that the climate crisis could cause nearly 250,000 additional deaths globally each year due to health risks associated with malnutrition, heat stress, and other health effects. And warmer temperatures can make it more challenging to battle infectious diseases. Dangerous illnesses like Lyme disease and malaria are borne through fleas, ticks, and mosquitoes, which can thrive when we have longer and hotter summers, shorter winters, and earlier spring seasons.

The climate crisis also puts the health of workers at risk. As we will hear, it can be particularly dangerous for farm workers: the folks who help grow the food that ends up on our dinner tables. Rising temperatures will make sustained work increasingly difficult for millions of workers with temperatures regularly breaching physiological limits.

Solving a crisis is also about protecting our kids and grandkids, as well as our aging parents and grandparents. Children have a higher risk of heatstroke and illness than adults, while older adults are vulnerable to extreme weather events that can cause power outages and require evacuations.

In recent years, wildfires also have left communities choking on smoke even when the fires are miles away. We have seen the deadly disruption of healthcare delivery during and after infamous storms like Katrina, Sandy, Harvey, Maria, and Michael. Those storms left healthcare facilities damaged, medical professionals displaced, and patients struggling to get needed care. While all Americans are at risk of suffering climate-fueled health problems, some populations are more vulnerable than others. Working class families, for example, face higher risk when floodwaters overtake their neighborhoods, bringing the mental strain of dealing with a disaster and carrying dangerous pathogens that put them at risk of physical illness. Decades of discrimination also have exposed working class communities and communities of color to extreme heat, putting them on the front lines of the climate crisis.

As we discuss climate solutions today, it is clear we must emphasize environmental justice for these vulnerable Americans. Congress shouldn't wait until it is too late for us to act on climate. We can turn things around, reduce climate impacts, and protect our communities, but the time to follow the science and act is now. I look forward to hearing from our distinguished panel of witnesses.

[The statement of Ms. Castor follows:]

Opening Statement of Chair Kathy Castor

Hearing on “Creating a Climate Resilient America: Overcoming the Health Risks of the Climate Crisis”

Select Committee on the Climate Crisis

February 5, 2020

As Prepared for Delivery

The climate crisis is making air pollution worse and, as temperatures rise, the public health suffers. Today we will explore the harms of the growing health impacts related to the climate crisis and what we can do about it.

One of our most important responsibilities as elected representatives is to keep our constituents safe. Congress has worked to keep Americans healthy, whether it's by protecting our drinking water, investing in life-saving medical research, or expanding access to health care.

While America has been fueled over the past two centuries by burning coal, oil and gas, over time those fuel sources have harmed public health. And now it's getting worse. The number and gravity of cases of heart and lung disease, asthma, extended allergy seasons, and the impacts of extreme heat are on the rise. And climate-aggravated illnesses are having a disproportionate impact on children, seniors and on our neighbors who work outside.

The science could not be clearer. The climate crisis is making Americans sicker, exposing them to stronger heat waves, dangerous wildfires, floods, droughts, and climate-fueled disasters. The changing climate is also altering the patterns of infectious diseases, making warm seasons longer, and threatening food security across the world. Unless we take bold climate action, global surface temperatures will continue to rise, making these risks even more dangerous.

But science also tells us that we can do something about it. We can reduce carbon pollution, increase energy efficiency, and move toward a clean energy economy. We can strengthen clean air and clean water protections. And we can solve this crisis by taking bold, urgent action to protect the health of all Americans. Curbing pollution can literally save lives and save America hundreds of billions of dollars.

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Solving this crisis is also about protecting our kids and grandchildren, as well as our aging parents and grandparents. Children have a higher risk of heat stroke and illness than adults, while older adults are vulnerable to extreme weather events that can cause power outages and require evacuations. In recent years, wildfires have left communities choking on smoke even when fires are miles away. We've seen the deadly disruption of health care delivery during and after infamous storms like Katrina, Sandy, Harvey, Maria and Michael. Those storms left healthcare facilities damaged, medical professionals displaced and patients struggling to get needed care.

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Congress shouldn't wait until it's too late for us to act on climate. We can turn things around, reduce climate impacts, and protect our communities. But the time to follow the science and act is now.

I look forward to hearing from our distinguished panel of witnesses.

Mr. Graves, our ranking member, is going to be a little bit late today. When he arrives, he will have the opportunity to give his opening statement. So, at this time, without objection, the other members who would like to submit opening statements may have 5 business days to do so.

And before I welcome our witnesses, I have two unanimous consent requests. We are going to go ahead and get them out of the way today. The minority has had an opportunity to review these letters. The first is from the American Psychological Association about the mental health impacts of climate change. The second is from the National Association of County and City Health Officials about the efforts local health departments are taking to address the health risks of climate change and the support that they need. [The information follows:]

Submission for the Record
Representative Kathy Castor
Select Committee on the Climate Crisis
February 5, 2020

AMERICAN PSYCHOLOGICAL ASSOCIATION
SERVICES, INC.,
February 4, 2020.

Hon. KATHY CASTOR,
Chair, House Select Committee on the Climate Crisis,
Washington, DC.

Hon. GARRET GRAVES,
Ranking Member, House Select Committee on the Climate Crisis,
Washington, DC.

DEAR CHAIRWOMAN CASTOR AND RANKING MEMBER GRAVES: When you think about climate change, mental health might not be the first thing that comes to mind. Americans are beginning to grow familiar with climate change and its health impacts: worsening asthma and allergies; heat-related stress; foodborne, waterborne, and vector-borne diseases; illness and injury related to storms; and floods and droughts. However, the connections with mental health are not often part of the discussion.

It is time to expand information and action on climate and health, including mental health. The health, economic, political, and environmental implications of climate change affect all of us. The tolls on our mental health are far reaching. They induce stress, depression, and anxiety; strain social and community relationships; and have been linked to increases in aggression, violence, and crime. Children and communities with few resources to deal with the impacts of climate change are those most impacted.

To compound the issue, the psychological responses to climate change, such as conflict avoidance, fatalism, fear, helplessness, and resignation are growing. These responses are keeping us, and our nation, from properly addressing the core causes of and solutions for our changing climate, and from building and supporting psychological resiliency.

To help increase awareness of these challenges and to address them, the American Psychological Association (APA) and ecoAmerica sponsored this report, *Mental Health and Our Changing Climate: Impacts, Implications, and Guidance*.¹ The report is intended to inform and empower health and medical professionals, community and elected leaders, and the public.

APA supports robust, science-based efforts to address a wide range of social issues, including climate change. APA is the largest scientific and professional organization representing psychology in the United States, and works to promote the advancement, communication, and application of psychological science and knowledge to benefit society and improve lives. Our membership includes more than 121,000 researchers, educators, clinicians, consultants, and students.

¹ <https://www.apa.org/news/press/releases/2017/03/mental-health-climate.pdf>.

We thank you for holding today's hearing and for considering the mental health aspects of climate change raised in our report. If you have any questions or need additional information, please contact Geoff Mumford, PhD, directly at 202.336.6067 or gmumford@apa.org.

RUSSELL SHILLING, PhD,
Chief Scientific Officer.

Submission for the Record
Representative Kathy Castor
Select Committee on the Climate Crisis

February 5, 2020

NATIONAL ASSOCIATION OF COUNTY &
CITY HEALTH OFFICIALS,
February 4, 2020.

Hon. KATHY CASTOR,
Select Committee on the Climate Crisis,
Washington, DC.

Hon. GARRET GRAVES,
Select Committee on the Climate Crisis,
Washington, DC.

DEAR CHAIR CASTOR AND RANKING MEMBER GRAVES: On behalf of the National Association of County and City Health Officials (NACCHO), representing the nearly 3,000 local health departments across the country, I write to thank you for highlighting the impact of climate change on our nation's health through the hearing, "Creating a Climate Resilient America: Overcoming the Health Risks of the Climate Crisis." Climate change has serious and far-reaching health implications for present and future generations. We appreciate your focus on this incredibly important issue.

Across the country, local health departments are tasked with addressing the many health risks that stem from climate change. As the climate continues to change communities will be susceptible to a number of health threats, including increased exposure to and geographic reach of vector-borne and infectious diseases like Zika and Lyme disease, exacerbation of respiratory conditions and allergies due to worsening air quality and pollution levels, food shortages, and lack of access to safe drinking water. Similarly, the increasing frequency and intensity of adverse weather event, like floods and wildfires, or natural disasters like hurricanes pose unique public health threats to the communities affected.

With the necessary resources, local health departments are uniquely positioned to prepare for and respond to these health impacts and protect the public's health. For example, NACCHO, with the support of the Centers for Disease Control and Prevention, offered a funding opportunity to supplement local health departments' ongoing climate change and health adaptation initiatives. In January 2019, NACCHO awarded the Boston Public Health Commission and the Marquette County Health Department (MI) each with \$15,000 grants to use in climate and health projects through July 31, 2019. In Boston, the grant supports the translation and printing of extreme temperature resource guides to reach all intended populations, particularly non-English speakers who may be the most vulnerable, while Marquette County is developing a public health emergency response plan specifically addressing climate change-related localized flooding, which is predicted to increase in this rural locality.

However, many more communities need this type of support to effectively plan and act to address the public health effects of climate change. Unfortunately, while NACCHO surveys have consistently found that local health officials are concerned about climate change, few feel that they have the tools to address it in a comprehensive way. Nearly eight out of ten local health department directors believe their local health department lacks the expertise to assess the potential impacts of climate change and effectively create adaptation plans to respond to climate change. While more than half of health department directors acknowledge the health impacts of climate change, less than 20% (one-fifth) have the resources and expertise needed to assess the potential impacts, create effective plans, and protect their community from these health impacts. A strong public health workforce is critical to be able to respond to the changing climate and best protect communities across the country from its effects.

NACCHO strongly urges all levels of government to collaborate with community stakeholders in preparation for and response to a changing global and local climate. Local health departments and the public health community can and should provide strong leadership in climate change mitigation and adaptation efforts.

Thank you, again, for holding this important hearing. Please contact Eli Briggs, NACCHO Senior Director of Government Affairs at ebriggs@naccho.org or 202-507-4194 if you require additional information or have any questions.

Sincerely,

LORI TREMMEL FREEMAN, MBA,
CEO.

Ms. CASTOR. In addition, Derrick Hollie was one of our scheduled witnesses. He was not able to join us in person today due to an illness, so we are sorry to miss him, but I ask unanimous consent to accept these letters from these organizations and that Mr. Hollie's testimony be added to the record.

Hearing no objection, so ordered.

[The information follows:]

Submission for the Record

Representative Kathy Castor

Select Committee on the Climate Crisis

February 5, 2020

REACHING AMERICA,
February 5, 2020.

THE SELECT COMMITTEE ON THE CLIMATE CRISIS,
Longworth House Office Building,
Washington DC.

GREETINGS CHAIR CASTOR, RANKING MEMBER GRAVES AND MEMBERS OF THE COMMITTEE: Thank you for this opportunity to speak.

I'm Derrick Hollie, president of Reaching America, an education and policy organization I developed to address complex social issues impacting African American communities. One of the issues Reaching America does the most work on is reducing energy poverty across the board.

Energy Poverty exists when low income families or individuals spend up to thirty percent of their total income on their electric bill. And when this happens, it puts people in a difficult situation and having to make tough choices like, do I eat today or pay the electric bill? Do I get this prescription filled or do I put gas in my car? We all know someone who faces these tough choices every month.

For members of minority, rural, low income and senior citizen communities, Energy Poverty is a reality. And unfortunately, members of our community don't have the luxury to pay more for green technologies and adequate health care. We need access to affordable energy to help heat our homes, power our stoves and get back and forth to work each day.

Through Reaching America I've had the opportunity to speak with thousands of African Americans in several states who question the rising cost of energy along with fees and subsidies they don't benefit from and how they struggle to keep up.

My passion for energy is deeply rooted, after graduating from college I worked as brakeman for Norfolk Southern Railways at Lambert's Point in Norfolk, Virginia. Our job and responsibilities was loading coal ships that transported coal all around the world and I constantly ask the question, "If our coal and natural resources are good enough for other countries—why is not good enough for us here at home. My grandfather was also a black coal miner in Southwest VA. It's safe to say if it weren't for the energy industry, I wouldn't be here to speak with all of you today.

When the government creates policy, its first priority should be the welfare of the people, especially those impacted the hardest, rather than big businesses and special interests looking for a handout. And if people can't afford to stay warm, they certainly can't afford healthcare especially those on a fixed income.

And here's a real-life example. Last week my eighty-four-year-old mother-in-law on a fixed income was at our house. She was complaining about a \$150 deductible on a prescription that needed to be filled. In addition to her electric bill that includes renewable mandates—a subsidy that she is required to pay and will never

benefit from it right here in the District of Columbia. My mother-in-law has three daughters that help her. However, millions of Americans don't have that benefit and are forced to try and balance paying for healthcare and energy. And most have to choose between one or the other.

A new study¹ out of Northwestern University confirms that increases in electricity and natural gas prices lead to more winter deaths. The effects were even larger among the poor, as families are forced to choose between putting food on the table, health care and keeping their homes warm. With the amount of affordable and reliable energy in America, these are choices we shouldn't have to make.

It would be helpful to have a "Impact Assessments" before any regulation is passed. This would be a major step toward increasing economic opportunities. And having input from Governors and community leaders the same way "Qualified Opportunity Zones" were created. It will also establish a level of trust in communities that never existed before.

After all, the government requires environmental impact statements to estimate the effects of projects like roads and buildings on nature. Shouldn't the government act similarly when it comes to how regulations impact the population?

A minority impact assessment would create a list of all the positive and negative impacts a proposed regulation would have on factors including employment, wages, consumer prices and homeownership. This regulatory impact would then be analyzed for its effect on minorities and other communities mentioned in contrast to the general population.

The bottom line, any policy that contributes to energy poverty is a bad one for low income families, minorities, rural and senior citizens communities. Fortunately, our nation has an abundant supply of natural gas that is a solution to our nation's energy needs. Recent polar vortex temperatures dropped so low in some areas that windmills couldn't turn. We need a plan B and that's Natural Gas.

Natural gas is clean. The U.S. Energy Information Administration reports that almost two-thirds of the CO2 emission reductions from 2006–2014 came from the fuel shifting toward natural gas. And right now, our air quality in America is the best it's been in decades. The New York Times even confirmed that in an article published June 19th, 2019.

Natural gas is also reliable. Natural gas generation efficiently meets the needs of our nation's energy grid. And natural gas is affordable. For many Americans, this allows them to not have to choose whether to keep the lights on or get a prescription filled.

In closing, I'm all for protecting the environment and clean energy however until we have figure out a way to harness the sun, wind and water to sustain ourselves, we need to use what we have especially if it can lower energy cost, create jobs and boost the economy and allow for adequate health care.

Ms. CASTOR. At this time, we want to welcome our witnesses. We have an outstanding panel today. Their testimony, I know you all have read it, is chockful of substantive recommendations for the Climate Committee's report that is coming out in March. You will recognize some of them, especially our first witness, Ms. Gina McCarthy. She is the new president and CEO of the Natural Resources Defense Council, NRDC, an organization that has been working to protect people and the environment for 50 years. Ms. McCarthy served as the 13th Administrator of the U.S. Environmental Protection Agency in President Obama's Cabinet and has worked for Republican Governors in senior leadership positions as well. She was a professor of the practice of public health at the Department of Environmental Health at the Harvard T.H. Chan School of Public Health and holds a master's degree in environmental health engineering, planning, and policy from Tufts University.

Welcome.

Dr. Aparna Bole is here today on behalf of the American Academy of Pediatrics where she serves as the chair of the Council on Environmental Health. Dr. Bole is a practicing pediatrician at UH

¹ <https://twitter.com/seemaecon/status/1110162658618040320>.

Rainbow Babies and Children's Hospital where she serves as medical director of community integration and is an associate professor of pediatrics at Case Western Reserve University School of Medicine.

Welcome, Dr. Bole.

And Mr. Arturo Rodriguez is here to testify on behalf of the United Farm Workers Foundation and the United Farm Workers of America. Mr. Rodriguez was president of UFW for over 25 years until 2018 and is now president emeritus.

Without objection, the witnesses written statements will be made part of the record.

With that, Ms. McCarthy, you are now recognized to give a 5-minute presentation of your testimony.

STATEMENTS OF THE HONORABLE GINA MCCARTHY, PRESIDENT AND CHIEF EXECUTIVE OFFICER, NATURAL RESOURCES DEFENSE COUNCIL; APARNA BOLE, M.D., FAAP, CHAIR, COUNCIL ON ENVIRONMENTAL HEALTH, AMERICAN ACADEMY OF PEDIATRICS; AND ARTURO S. RODRIGUEZ, PRESIDENT EMERITUS, UNITED FARM WORKERS, UFW FOUNDATION.

STATEMENT OF THE HONORABLE GINA MCCARTHY

Ms. MCCARTHY. Thank you very much. Hi. Good morning, everybody. First of all, thank you Chairwoman Castor and Ranking Member Graves, when he gets here, and members of the select committee for holding this hearing.

I have three children, and I am lucky enough to also have two grandchildren that I absolutely adore is probably not too strong a word. And they will be both 32 and 31 years old in 2050, and that is the year that science tells us that we must have a zero carbon future if we want to avoid the most destructive climate impacts, and that is really why I am here today.

All of a sudden, 2050 isn't so far away, and it is my responsibility to defend a healthier and brighter future for all of our kids. It is our climate fight, and it is really always going to be that personal to me and I think to everyone.

At the Environmental Protection Agency, our success was measured in lives saved, healthier kids, and fewer asthma attacks. Climate change was in our purview because the mission was to protect people from pollution, just like the carbon pollution that is fueling climate change. So this is not a partisan issue. This is an issue of science.

I took the helm of one of the premier environmental organizations in the world, NRDC, because I could not sit on the sidelines. We need to restore science as the foundation of sound public policy, and we need to change how we fuel our global economy. And, frankly, we don't have time to put our heads in the sand anymore or to muzzle our scientists about telling us what is really happening in the world. We must recognize that carbon pollution is not an equal opportunity killer. Climate warming pollution targets our children, the elderly, the poor, and the powerless, especially communities of color, who often live right next to power plants and refineries and busy roadways. You know, 4 million kids each year de-

velop asthma simply because they have the misfortune of living near a major roadway. If you are a parent and your child uses an inhaler, these statistics are very real to you, and shame on all of us for not already doing more to protect those children. The health risks associated with climate change carry a steep human toll and economic cost. NRDC and the University of California in San Francisco recently teamed up to try to quantify that cost. When you stack up fewer than a dozen climate-related events in 2012, including wildfires in Colorado and Washington State, Lyme disease in Michigan, and algal blooms in Florida, among others, you get \$10 billion in healthcare costs. About 65 percent of those medical bills were paid for by Medicare and Medicaid, pointing to the outsized harm of climate change to older adults and low-income people.

Yes, climate change is the world's biggest public health challenge today, but it is also an incredible opportunity for all of us because we can tackle this, and we can invest in the kind of things we need to make a better future. We can move solutions that are already available, the clean energy that is the revolution of today. We can make healthier communities. That is what this committee is all about, turning the climate crisis into the biggest opportunity we have to invest in the future for ourselves and our children. Nationally, the cost of solar and wind dropped more than 25 percent last year alone. From 2010 to 2018, wind, solar, and geothermal more than tripled its proportion of our natural energy mix. We are winning, folks, when it comes to clean energy. We have to start acting like it, celebrating our success and grabbing for more. Energy efficiency, which is essential to decarbonization, employs 2.3 million people, which is twice as many as the entire fossil fuel industry. The regional greenhouse gas initiative in the northeast, which is a multi-state effort to cut carbon pollution from the power sector, it has delivered billions of dollars in health benefits, and it has led to cleaner and lower infant mortality rates.

I just will not buy the argument that economic hardship accompanies public health protections. In fact, I believe it is exactly the opposite, and we have shown that time and time, again. You know, my kids and grandchildren are my moral compass. They are my reason to sit here today, and I ask each of you to think about who you are fighting for and what you are doing to defend our kids' health and their future.

I look forward to continuing to work with the select committee as you build your climate policy recommendations for Congress. Thank you very much.

[The statement of Ms. McCarthy follows:]

**Written Testimony of Gina McCarthy, Natural Resources Defense Council,
Before the House Select Committee on the Climate Crisis**

**Hearing on: Creating a Climate Resilient America: Overcoming the Health
Risks of the Climate Crisis**

February 5, 2020

Thank you to Chairwoman Castor, Ranking Member Graves, and members of the select committee for holding this hearing. Our climate crisis continues to hurt our economy, threaten our national security, and harm public health. That's what I want to focus on today—how climate change is making people sick, what govern-

ment should do about it, and the policies we need, not only protect and improve public health, but create a brighter future for all Americans.

I have three children, Daniel, Maggie, and Julie. I'm also lucky enough to have two grandkids to love and cherish. I cannot help but think that they will only be 32 and 31 years old in 2050—the year when science tells us we must achieve a zero-carbon economy, if we hope to keep pollution to levels that avoid the most destructive impacts of climate change. Before these children were born, 2050 seemed far away; but not anymore. I remember the first time that my child was handed to me right after I gave birth. I looked at my son Daniel and at first glance fell impossibly in love with him. But in some ways, I was terrified, too. From that moment forward, my future and my happiness was no longer about me, they were dependent on the health and happiness of my son, my daughters—and now, my grandchildren. It was my responsibility to protect them as best I could and it's why I keep fighting today. That's what climate change is about. It's that personal.

I spent 4 years running the Environmental Protection Agency. It was the honor of my lifetime to work alongside such smart, hardworking and committed career staff. EPA's mission is to protect public health—and its success is measured in human lives saved, fewer kids with asthma attacks, and how well we protect those most vulnerable from harm.

Climate change came under our purview because, at its core, this is an issue of pollution and public health. This is an issue of protecting people, not just the planet for the planet's sake.

I also worked for six governors prior to working for President Obama. Five of them were Republicans. None of them told me I should make sure to deliver contaminated water to their house. None of them told me they wanted their grandchildren to breathe dirty air. None of them told me to ignore the vastly unfair pollution concentration in communities of color. Pollution, including carbon pollution that fuels climate change, is not—and should not be—a partisan issue.

But I recently made the shift after 35 years in government to take the helm of one of the premier environmental advocacy organizations in the world, the Natural Resources Defense Council. I never once questioned whether any work other than public service could be more productive, fulfilling, or important. I went to NRDC because they do the necessary work of lifting up stories and delivering the scientific analysis that clearly shows the connection between climate change and health. The risks are real—families are facing harm and decision makers with the power to act need to continually and loudly be shown the truth.

I joined NRDC because we must rebuild our long-standing public health protections, resuscitate our efforts to combat climate change, and restore science as the foundation of sound public policy. We must end the destruction of cost-effective laws and regulations like the Mercury and Air Toxics Standards and the Clean Car Rules; and we must end the marginalization of career professionals, scientists, and experts through relocations and reassignments.

I'm here to preserve, protect, and defend our irreplaceable natural resources, our precious wildlife, and the biodiversity we all depend on—a sacred obligation that historically has enjoyed strong bipartisan support.

The era of willful ignorance and flat-out denial of our climate crisis must end. It's an urgent challenge intensifying by the hour; we must work to change the way we fuel the world's economies.

I am here to talk about why climate change is the most significant public health challenge in the world today, but also why it can be the most important public health opportunity of our lifetime. I want us to stop focusing on what we are trying to avoid, and instead build the future we want to see. I want us to stop just explaining why we must run from pollution and devastation and start talking about investing in the kind of future we need, a future that is clean, healthy, more just, more sustainable, and no longer reliant on fossil fuels.

Building a climate-resilient America means real investments—investments that recognize the steep health costs of inaction. It means recognizing that pollution kills, and that it is not an equal opportunity killer. It disproportionately poisons our children and the elderly, the poor and the powerless, and communities of color.

While we could spend this entire hearing on the vast and complex health harms fueled by climate disruption; today, I'll spend time briefly detailing a few major areas of concern.

Climate-fueled disasters and rising temperatures are already making people sick. In just the last few years, wildfire smoke has choked major cities in the West. Record drought has starved farming communities of safe drinking water. And hurricanes in the Southeast have contributed to a growing mental health crisis tied to

increased suicide.¹ *The Lancet* Countdown on health and climate change, an annual snapshot developed by 35 academic institutions around the world, reports that losses in crop yield, increases in water-borne disease, and lethal weather events will profoundly affect “the life of every child born today.” The authors write: “Without accelerated intervention, this new era will come to define the health of people at every stage of their lives.”

Climate change is worsening air pollution. Roughly 80 percent of our country’s climate-warming pollution, and most of the other air pollution that causes or exacerbates heart and lung diseases, comes from burning coal, oil, and natural gas. One of the many harmful byproducts of fossil fuels are small particles called PM2.5. In 2016, PM2.5 contributed to the early deaths of more than 64,000 Americans. These types of environmental health risks widened inequality. Communities of color living closest to power plants, oil and gas operations, and busy roads bore the heaviest burden of this pollution.² In 2015, African American children were 4 times more likely to go to the hospital for asthma and 10 times more likely to die from asthma than non-Hispanic white children.³ The first few rungs of any ladder of opportunity are clean air to breathe and clean water to drink. The government’s job and this body’s focus, is to act to protect people from pollution and balance the scales for those most impacted.

Climate change is increasing the intensity and frequency of dangerously hot days. Heat waves have gotten worse in 61 percent of major Southeast cities, including Birmingham and New Orleans, to name a few.⁴ Extremely hot days aren’t just an inconvenience: they lead to brain and kidney damage, premature births, heart attacks, and stroke. Research from the Harvard T.H. Chan School of Public Health shows we’re seeing heat impact health, cognitive function, reaction time, impulsivity, aggression, and violence. In Boston and across cities in the U.S. there are significant increases in police and fire department calls on hot days related to medical emergencies, violent and aggressive crimes, and accidents. Outdoor workers and professionals, including members of our military, are vulnerable to heat-related illnesses. Take a moment to picture where many of our military bases are located at home and abroad. Then think about all the heavy gear service members carry and the strain from training and fighting. From 2014 to 2018, the rate of heat stroke among active duty members increased 73 percent and the rate of heat exhaustion increased nearly 53 percent. Across the country, extreme heat also led to the loss of approximately 1.1 billion potential work hours from 2000 to 2018—with the largest losses in states like Louisiana, Alabama, Georgia, and Florida.

The health risks associated with climate change—death, illness, disruptions to care from disasters, and lost workdays—carry a steep economic cost. NRDC and the University of California, San Francisco recently teamed up to quantify that cost. If you add up the costs of just 10 climate events in 2012, including wildfires in California, Lyme disease in Michigan, and algal blooms in Florida, among others—you get about \$10 billion in health costs across the United States. And about 65 percent of the illness costs were paid for by Medicare and Medicaid, pointing to the outsized harm of climate change to older adults and low-income people. A recent analysis of Medicaid use in and around Baton Rouge, Louisiana, showed higher numbers of claims and higher costs to the system after catastrophic flooding in 2016. About a third of visits among men and women were for substance abuse and depression-related disorders, respectively. This study echoes the findings of so many others: that severe weather events are a significant threat to our mental health.

Sadly, the story in Baton Rouge is a familiar one across the country. As I said, pollution is not an equal opportunity killer. The imbalance in harm demands we aim for balance in our solutions. Significant amounts of money will need to be spent to stop carbon emissions and to adapt to our changing climate—the longer we take, the higher the cost. A 2019 study by EPA scientists found that proactively adapting roads and rail networks to climate disruption would prevent twice as much damage as reactively adapting.⁵ But how much bang for the buck we get from these investments depends on where we spend it and on what. Are we going to be smart and focus our resources on protecting the people who are *most* vulnerable today, the people who need investment quicker and in larger amounts, the people living in places

¹ <https://www.vox.com/policy-and-politics/2018/3/20/17138990/puerto-rico-hurricane-maria-6-months> and <https://www.usnews.com/news/best-states/north-carolina/articles/2018-11-05/suicide-raises-florence-death-toll-to-41-in-north-carolina>.

² <https://www.lancetcountdownus.org/2019-lancet-countdown-us-brief>.

³ <https://www.minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=15>.

⁴ <https://nca2018.globalchange.gov/chapter/19/>.

⁵ <https://www.nature.com/articles/s41558-019-0444-6>.

where people are dying today? If we do, we can build momentum to get us on the path towards a more sustainable and more just future.

I'm proud that NRDC, along with other major environmental groups, has signed onto the Equitable and Just National Climate Platform. The two key principles of the platform are, to enact solutions that address the legacy of pollution, and to make justice and equity a priority in any climate solution.

The good news is we have solutions that shift us away from carbon pollution and move us towards clean energy and cleaner communities. We have plenty of opportunities to make real progress. Even if progress is incremental, forward movement matters. It shows what's possible, broadens engagement, and builds hope. People will continue to see the clear benefits of a low carbon future—and will continue to want it, demand it, and run towards it.

So how do we create that future? First and foremost, we need to tackle the root cause of climate change: pollution from fossil fuels.

Congress needs to lead in reducing emissions in the U.S. and beyond. It must speak out and respond to the Trump administration's efforts to undermine fuel efficiency standards and clean power regulations, among many other rollbacks, that are taking us in the wrong direction and putting public health at risk.

What we need are policies that get us to net-zero emissions economy-wide by 2050 at the latest. NRDC sees a number of possible paths to achieving this and is eager to work with anyone and everyone in Congress to achieve that goal.

Ramping up energy efficiency, which is essential to decarbonization has been and will continue to be a job creator; the U.S. is home to 2.3 million energy efficiency jobs, employing twice as many workers as the entire fossil fuel industry.⁶ One hundred percent clean energy is within reach, if we keep investing in innovation. The three states leading the country in producing wind power are Texas, Iowa, and Oklahoma. Why? Because it makes clear economic sense: nationally, the cost of solar and wind power dropped more than 25% last year alone.⁷ From 2010⁸ to 2018,⁹ wind, solar and geothermal more than tripled its proportion of our national energy mix.

For the transportation sector, the single largest source of carbon emissions, that means a zero emission vehicle market transformation through federal incentives for vehicle purchases and investment in networked charging infrastructure like those found in *H.R. 2256, the Drive America Forward Act* or *S. 674, the Clean Corridors Act*. And it means states working together to protect the California waiver and expand its reach, as well as regional carbon action like the cap and invest strategy that states are employing as part of the Transportation and Climate Initiative (TCI). This kind of transformation to a clean economy will create countless jobs and opportunities. There are already 3.2 million Americans working in clean energy and vehicles right now.

The power sector is the nation's second largest source of carbon pollution, down from being the largest source a decade ago. Why? Because a clean energy transition is already underway. States across the country are seeing the cost *and* health benefits of shifting power generation to cleaner sources. The economically prudent thing to do is also the prudent public health thing to do. But it all needs to happen faster and recognize the hardship for some workers and communities as economic activity shifts to cleaner energy production and delivery. That's why it's essential that inclusive and meaningful transition plans for workers are designed and adopted for those currently employed in highly-polluting sectors, and for communities that have depended on those industries for so long.

Let me give you an example of effective regional action: the Regional Greenhouse Gas Initiative in the Northeast—a multi-state effort to cut carbon pollution from the power sector, which also has reduced other forms of air pollution that I helped design and implement when I was working for the State of Connecticut. RGGI has had a measurable impact on improving health. In the last two decades, the cap and invest program has resulted in billions of dollars in health benefits¹⁰ and is associated with decreased mortality of infants.¹¹ Not to mention, RGGI states continued to grow their economies while cutting carbon pollution nearly in half.

⁶ <https://www.nrdc.org/experts/lara-ettenson/energy-efficiency-jobs-soar-now-make-them-available-all>.

⁷ <https://www.utilitydive.com/news/renewable-energy-prices-keep-falling-when-do-they-bottom-out/555822/>.

⁸ <https://www.eia.gov/electricity/data/state/>.

⁹ <https://www.eia.gov/electricity/data/state/>.

¹⁰ <https://fas.org/sgp/crs/misc/R41836.pdf>.

¹¹ <https://bmjopen.bmj.com/content/9/4/e024735>.

One of the most remarkable things about cleaning up our power plants, our cars, and our factories is that *we don't have to wait for decades* to see results. A recent review by the Forum of International Respiratory Societies found that community members can experience better health just two weeks after significant cuts to nearby sources of pollution. Benefits include fewer premature births, missed school and work days, and deaths from heart and lung problems.¹²

As we implement these climate solutions, we also need to rethink how we approach the delivery of health services, how we build and renovate critical infrastructure, and how we prepare for and respond to disasters. An obvious place to start is with our public health system. At its core, public health is about keeping people healthy by preventing harm rather than by treating symptoms. But right now, annual public health spending in the United States amounts to just \$255 per person.¹³ Cash-strapped state and local public health officials simply cannot focus on the climate crisis when they are dealing with issues like the opioid crisis or coronavirus. NRDC strongly supports Congressional action to increase funding and capacity for the U.S. Centers for Disease Control's Climate and Health program, which is the only direct federal support for state and local agencies trying to prevent climate-related health harms.

We must also prioritize the climate resilience of our hospitals and other healthcare facilities. Despite recent progress in disaster preparedness, we've seen too many examples of extended disruptions in care delivery, permanent hospital closures, and massive layoffs of healthcare workers. Federal funding for hospitals and other healthcare facilities should be conditioned on climate planning and risk assessments. Babies were literally being born in smoke filled hospitals in Australia, due to the historically devastating climate-charged wildfires that have burned down massive swaths of their country.¹⁴ The United States has roughly 200 federal hospitals that should be put through "climate and health stress tests" to ensure they can maintain essential services in a hotter and wilder world.

One piece of legislation that would address both areas is the Climate Change Health Protection and Promotion Act of 2019 (H.R. 1243/S. 523). The bill would, among other things, result in a national action plan to ensure our public health and healthcare systems are ready for the climate crisis.

And what does the world look like if we succeed at both ending our dependence on deadly fossil fuels and creating a more climate-resilient society? It looks cleaner, safer, healthier, and more prosperous.

It looks like workers returning safely home at the end of their shift. It looks like shady, tree-lined neighborhoods with clean, breathable air and drinkable water. It looks like diverse options for clean transportation that get people where they need to go on time. And it looks like a family sitting down to a table with enough good food to go around, and without worrying about paying their medical bills or packing for yet another evacuation to get out of harm's way.

I know that in the United States we have an administration that doesn't want to recognize climate change or climate science, but this administration doesn't represent the views or the value or the character of the United States of America. Just the opposite. The anti-science intransigence of the Federal Government is igniting action across our country at the local, state and regional levels.

I am confident that everyone in this room—no matter their party affiliation—is here to do the hard work needed to leave this country, and our world, better than we found it. We are here to defend the future for our children. I'm a mother and a grandmother—my kids and grandkids are the face of climate change for me; they are my moral compass and my reason to sit here today. They are the reason I fight.

I ask the members, and everyone else here today to think about who you fight for, why you fight, and what you can do to help.

At times like these, when the furor of partisan politics seems to run so hot and so deep that it's can be overwhelming, we cannot lose sight of the core values that bind us together. Surely one of those values must be protecting the health and wellbeing of our kids.

Thank you for convening this critical conversation and for your attention. I look forward to continuing to work with the select committee as you develop your climate policy recommendations for Congress.

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Ms. CASTOR. Thank you.

¹² <https://www.atsjournals.org/doi/10.1513/AnnalsATS.201907-538CME>.

¹³ <https://www.tfah.org/wp-content/uploads/archive/assets/files/TFAH-2018-InvestInAmericaRpt-FINAL.pdf>.

¹⁴ <https://www.insider.com/australian-bushfires-babies-delivered-in-smoky-hospitals-2020-1>.

Dr. Bole, you are recognized for 5 minutes.

STATEMENT OF APARNA BOLE, M.D., FAAP

Dr. BOLE. Thank you. Thank you, Chair Castor, Ranking Member Graves, and committee members, and good morning. My name is Dr. Aparna Bole, and as Chair Castor mentioned, I am a pediatrician practicing in Cleveland, Ohio, and I am here today on behalf of the American Academy of Pediatrics as chair of the AP Council on environmental health. Thank you for the opportunity to testify today about the critical child health risks of climate change and the child health benefits of climate solutions.

Children are disproportionately burdened by and uniquely vulnerable to the health impacts of climate change as a result of their physiology and because of their developmentally appropriate behaviors.

Pediatricians see firsthand how kids' health is affected by climate change today. For example, in my home State of Ohio, we care for infants hospitalized during increasingly frequent extreme heat events, children whose drinking water is less safe because of how increased extreme precipitation and increased water temperatures promote toxic algae in our great lake, and children with asthma exacerbations because of high ozone and allergens in the air we breathe.

These and other climate change related phenomena, such as increased frequency of severe weather events and wildfires, changing patterns of vector-borne diseases, impaired food security, and mental health effects. These harm kids across the United States and are described in detail in my written testimony. One of my young patients is a sixth grader with asthma whom I will call Jordan. Jordan is obese, and I have been working with him and his family on a healthier diet and exercise. Last summer he signed up for a sports camp at the local Y just like we planned, but when he came in for his sports physical, I found myself conflicted. I praised him, but I also had to warn his parents to watch the air quality index. Outdoor summer sports practiced on a high ozone day could dangerously exacerbate his asthma. The very thing I had recommended to help promote Jordan's health, now could be dangerous, in part, because of climate change. Just as Jordan struggled to balance playing outside in the summer with ensuring that he can breathe, I struggle with caring for my patients when climate change affects so many intersecting aspects of their lives.

Pediatricians have several recommendations to Congress to address this challenge. Comprehensive climate legislation should accelerate energy efficiency and renewable energy production while decreasing incentives for fossil fuel production. The AP supported the original 2015 clean power plan, and we urge the reinstatement of this vital policy. The AP also supports the implementation of an effective carbon fee and dividend regime to reflect the true societal cost of carbon pollution, including its health costs. Any such policy must preserve EPA's proven authority to regulate carbon pollution. To achieve net zero carbon pollution, it is essential to reduce the carbon footprint of our transportation systems. This should include reducing motor vehicle emissions, expanding public transportation, and increasing construction of safe bikeways and walkways. Cli-

mate legislation should improve the adaptability and resilience of our food system by promoting crop resilience and reducing the greenhouse gas contributions of animal agriculture. The U.S. healthcare sector must adapt to both reduce its contribution to climate change and improve its resilience. Federal policy should incentivize energy efficiency, clean energy, and adaptation strategies for the health sector. We must also educate healthcare providers and vulnerable patients about climate-associated health risks and how climate change impacts our clinical practice.

The AP supported the Paris Agreement to engage the global community in emissions reduction targets and has supported H.R. 9, the House-passed legislation to maintain the U.S. commitment to the Paris Agreement's emissions reduction targets. Finally, we encourage Federal policy to emphasize environmental justice, acknowledging the disproportionate impact of climate change's health effects on historically marginalized populations, such as indigenous communities, other communities of color, and those who are socioeconomically disadvantaged. While children bear an outsized burden of the health impacts of climate change, climate solutions can support cleaner air, sustainable communities with safe places for our kids to walk and play, and healthier food systems. These have immediate child health benefits and help to ensure that future generations of children will thrive.

Thank you, again, for the chance to testify today, and I look forward to answering your questions.

[The statement of Dr. Bole follows:]

Testimony of Aparna Bole, MD, FAAP

Chair, AAP Council on Environmental Health on behalf of the American Academy of Pediatrics

**Testimony Before the U.S. House Select Committee on the Climate Crisis
Creating a Climate Resilient America:
Overcoming the Health Risks of the Climate Crisis**

February 5, 2020

Good Morning Chair Castor, Ranking Member Graves, and Committee Members. My name is Dr. Aparna Bole. I'm here today on behalf of the American Academy of Pediatrics (AAP), a non-profit professional organization of 67,000 primary care pediatricians, pediatric medical subspecialists, and pediatric surgical specialists dedicated to the health, safety and well-being of infants, children, adolescents, and young adults. I currently serve as the Chair of the AAP Council on Environmental Health, leading the Academy's work developing our evidence-based policy statements on issues impacting children's health, our efforts to educate pediatricians and parents about environmental health concerns, and our advocacy at every level of government for policies that improve children's environmental health.

In addition to my role with the AAP, I am an Associate Professor of Pediatrics at Case Western Reserve University School of Medicine, and I am a practicing pediatrician at UH Rainbow Babies and Children's Hospital, where I serve as Medical Director of Community Integration.

I would like to extend our appreciation to the Committee for holding this critical hearing. The AAP views addressing climate change as a vital child health priority, and I am grateful for the opportunity to testify today about the child health impacts of climate change, the child health benefits of climate solutions, and federal policy opportunities to address these.

In clinics and hospitals throughout the United States, pediatricians are witnessing the immediate harms and risks that climate change poses to the health of their patients. The AAP has long called for policies to address the global challenge of climate change and protect the health and wellbeing of children. Underpinning that work is the Academy's policy statement¹ dedicated to articulating the science

behind the ways in which climate change impacts child health and the opportunities to address it. My testimony today will outline the scientific consensus on climate change, highlight the ways in which climate change is uniquely harmful to children's health, and offer policy recommendations for your consideration to address those effects and improve the health of children.

Children are Uniquely and Disproportionately Harmed by Climate Change

Climate change is affecting the health of children in the United States here and now, and pediatricians see these effects in their patients every day. Children are uniquely vulnerable to the health impacts of climate change, and any comprehensive response to climate change must take child health into account. The World Health Organization estimates that over 80 percent of the existing global burden of disease attributable to climate change occurs in children younger than 5 years old.ⁱⁱ Children's immature physiology and metabolism; critical windows of development; higher exposure to air, food, and water per unit of body weight; unique developmentally appropriate behavior patterns; and dependence on caregivers place them at much higher risk of climate-related health burdens than adults.ⁱⁱⁱ The health impacts of climate change are greatest for children and communities already experiencing socioeconomic disadvantage,^{iv} which also presents significant environmental justice concerns.

Climate Change is a Public Health Crisis that Uniquely and Disproportionately Harms Children

Climate change is an ever-growing global threat that has unique and disproportionate impacts on children. A large consensus of climate scientists now conclude based on extensive scientific evidence that the major physical, chemical, and ecological changes of our planet can be attributed to human activity, which includes the burning of fossil fuels. Atmospheric carbon dioxide and other greenhouse gas levels began to increase about 100 years ago, leading to subsequent increases in global temperatures.^v Warming of the planet is unequivocal. According to the Intergovernmental Panel on Climate Change, each of the last 3 decades has been successively warmer than any preceding decade since 1850. The globally averaged temperature (combined land and ocean surface) increased approximately 1°C between 1850 and 2012. Since recordkeeping began in 1880, the global sea level has risen approximately 8 inches because of melting of glaciers and thermal expansion of warmer water. In turn, the effects of climate change are creating myriad significant public health concerns. These effects are especially harmful to the health and wellbeing of children.

Climate change is affecting the health of children in the United States here and now, and pediatricians see these effects in their patients every day. Children are uniquely vulnerable to the health impacts of climate change, and any comprehensive response to climate change must take child health into account. The World Health Organization estimates that over 80 percent of the existing global burden of disease attributable to climate change occurs in children younger than 5 years old.^{vi} Children's immature physiology and metabolism; critical windows of development; higher exposure to air, food, and water per unit of body weight; unique developmentally appropriate behavior patterns; and dependence on caregivers place them at much higher risk of climate-related health burdens than adults.^{vii} The health impacts of climate change are greatest for children and communities already experiencing socioeconomic disadvantage,^{viii} which also presents significant environmental justice concerns.

How Climate Change Impacts Children's Health

Increasing Frequency and Intensity of Natural Disasters and Extreme Weather

Extreme weather events, including severe storms, floods, and wildfires, directly threaten children with injury, displacement, and death. The frequency of reported natural disasters has increased over the past 40 years. Three times as many extreme weather events occurred between 2000 and 2009 as occurred between 1980 and 1989. The scale of natural disasters has also increased because of deforestation, environmental degradation, urbanization, and intensified climate variables. These events place children at risk for injury,^{ix} loss of or separation from caregivers,^x exposure to infectious diseases,^{xi} indoor exposure to mold and other allergens,^{xii xiii} and a uniquely high risk of mental health consequences, including posttraumatic stress disorder, anxiety disorders, depression, adjustment disorder, and suicide in adolescents.^{xiv xv}

The distinctive health, behavioral, and psychosocial needs of children subject them to unique risks from these events. Disasters can cause irrevocable harm to children through devastation of their homes, schools, and neighborhoods, all of

which contribute to their physiologic and cognitive development.^{xvi} Adverse Childhood Events (ACEs), such as the destruction of homes, schools and neighborhoods, family structures and communities, have impacts beyond childhood on adult health. Individuals with a history of ACEs are more likely to have hypertension, diabetes, and other adult health problems across the life span.^{xvii}

Rising Heat-Related Morbidity and Mortality

Extreme heat is a leading cause of weather-related death in the U.S., and children suffer directly from the increased severity and duration of heat waves. Studies performed in multiple countries have shown an increase in child morbidity and mortality during extreme heat events. Infants younger than 1 year and high school athletes seem to be at particularly increased risk of heat-related illness and death. The experience of unusually warm temperatures during pregnancy is associated with increased risk of preterm birth,^{xviii} which increases the risk of immediate and long-term health problems as well as infant mortality. Researchers estimate there is a greater than 90% chance that by the end of the 21st century, average summer temperatures will exceed the highest temperatures ever recorded in many regions across the world, putting children and their families at increasing risk of heat injury.^{xix} Heat waves have become more frequent and/or prolonged in many regions, and the number of extreme cold waves in the United States is also the lowest since recordkeeping began.^{xx}

Worsening Air Quality

Air quality can be reduced through temperature associated elevations in ground-level ozone concentration, increased pollen counts and allergy season duration, and wildfire smoke. All of these factors exacerbate respiratory disease and asthma in children.^{xxi} Climate change-related warming leads to elevated ozone pollution, which are particularly harmful to children's developing lungs and brains and linked to poor birth outcomes, infant mortality, missed school days, and asthma attacks.^{xxii} Fossil fuel combustion also releases harmful pollutants such as particulate matter, which has been linked to premature death, asthma exacerbations, and other respiratory symptoms that are most likely to affect children. Higher CO₂ concentrations cause ragweed to produce more pollen, and warmer temperatures allow these plants to bloom longer. The allergy season is longer now, especially in northern latitudes. Seasonal allergies affect 10 percent of American children, and every spring and fall pediatric offices are filled with children suffering from severe allergies.^{xxiii xxiv xxv xxvi} These climate change-related elevations in ozone and intensification of the aeroallergen season both disproportionately harm children with asthma. African American and Hispanic children have higher rates of asthma and are more likely to suffer from these air pollution hazards that are exacerbated by climate change.

Changing Patterns of Infectious Diseases

Climate influences the behavior, development, and mortality of a wide range of living organisms, some of which have the potential to carry or cause pediatric infection. Determining the effects of climate change on infectious diseases is complex because of confounding contributions of economic development and land use, changing ecosystems, international travel, and commerce. Climate change-related warming has been linked to the northern expansion of Lyme disease in North America and ^{xxvii} increase in mosquito-carried viruses,^{xxviii} and has been projected to increase the burden of child diarrheal illness, particularly in Asia and sub-Saharan Africa. Concern has also been raised for climate links to emerging infections, including coccidioidomycosis and amoebic meningoencephalitis. Further investigation into climatic influence on infectious diseases and their impact on children is needed to ensure we understand the full extent of these connections and how best to address them.^{xxix}

Reducing the Food Supply and Increasing its Costs

Altered agricultural conditions, including extreme heat, expanded water demands, and increased severe weather events, will affect food availability and cost, particularly in vulnerable regions in which child undernutrition is already a major threat. The decreased protein, iron, and zinc content of certain staple crops like rice has been demonstrated for plants grown under increased CO₂ conditions, carrying significant implications for child nutrition.^{xxx} These detrimental effects will exacerbate U.S. food insecurity and undermine ongoing efforts to promote high-quality nutrition for all children.

Young People are Speaking Out

Given the ways that climate change is disproportionately harming children and adolescents, it is unsurprising and inspiring to see so many young people advocating for solutions to our ongoing climate crisis, including before this very Committee. Pediatricians have been honored to stand behind young people calling for action to address the ways climate change is already affecting them and will continue to harm their lifelong health. We were grateful to have the opportunity to file an *amicus curiae*^{xxx} brief supporting the plaintiffs in the *Juliana v. U.S.* case, in which youth filed suit against the Federal Government over its inaction to address the ways climate change is harming them. While we were disappointed to see the Ninth Circuit rule that the courts cannot redress those concerns, we continue to proudly stand in support of young people advocating for solutions to this public health problem that particularly affects them.

The Need for Federal Action

Given these unique circumstances and vulnerabilities, Congress must act to address the child health threat of climate change. Children are already disproportionately bearing the burden of climate change and will continue to do so if we do not enact significant policy changes. Not only do we need to act, but we need to specifically address the ways climate change affects children in both our mitigation and adaptation efforts. We thank the Committee for its important work on these efforts and urge you to ensure that any comprehensive legislation to address climate change include specific considerations on addressing and mitigating its impact on children.

Federal Policy Opportunities to Address the Child Health Impact of Climate Change

While the child health detriments of climate change are manifold and daunting, the encouraging news is that there are policy opportunities to address it that yield child health benefits. While the science underpinning novel responses grows and evolves daily, we already know much of what needs to be done, and simply need decisive bipartisan action to advance a comprehensive climate change and child health agenda. The following are our recommendations across several policy sectors.

De-Carbonizing the Energy Sector

Power plants are a significant contributor to climate change, generating over one-quarter of all U.S. greenhouse gas pollution. To decarbonize the energy sector, comprehensive climate legislation should promote energy efficiency and renewable energy production at the federal, state, and local levels while decreasing incentives for continued production and consumption of carbon-intensive fuels such as coal, oil, and gas.

The AAP supported the Clean Power Plan (CPP) in 2015, and in 2018 and 2019 opposed the U.S. Environmental Protection Agency's (EPA) proposed attempts to undermine its effectiveness. The CPP would have significantly limited carbon pollution from both new and existing sources of carbon pollution from fossil fuel-fired power plants. In addition to addressing climate change, this policy would have had the added benefit of also decreasing co-pollutants from power plants, such as particulate matter. Reducing these pollutants under the CPP would have prevented up to 6,600 premature deaths. In addition, it would have resulted in up to 150,000 fewer asthma exacerbations in children, and 180,000 fewer missed school days in the year 2030.^{xxxii} EPA has clear authority to regulate carbon pollution from power plants, and we urge the reinstatement of this vital policy.

In addition, the AAP supports terminating federal subsidies and tax incentives for the production and transport of coal, oil, and gas, and increasing federal subsidies for clean, renewable energy sources such as wind, solar, and hydropower. The AAP also supports the implementation of an effective carbon fee and dividend regime to accurately reflect the true societal of carbon pollution, including its health costs.

It is critical that any such policy regime not undermine critical public health protections in the Clean Air Act, including the EPA's authority to regulate carbon pollution under section 111(d). EPA's proven authority to regulate hazardous air pollutants under the Clean Air Act, twice affirmed by the U.S. Supreme Court, is a vital tool to address climate change and protect health, and no legislation should undermine, pause, or weaken that authority. Existing legislative proposals to institute a carbon fee also include provisions to halt certain vital EPA regulatory authorities, roll back climate safeguards, or immunize fossil fuel companies against any potential liability for damages caused by their contributions to climate change. Due to the urgency of addressing climate change with all available tools, comprehensive climate legislation must not weaken existing avenues of

reducing carbon pollution, such as EPA's Clean Air Act authority. The AAP would oppose decarbonization legislation that eliminates these essential public health protections.

Reducing Carbon Pollution from Transportation

To achieve net zero carbon pollution, it is essential to reduce the carbon footprint of transportation systems. Climate mitigation strategies focused on reforming the transportation sector have the potential to spur significant positive impacts on child health through improved safety and physical activity.^{xxxiii} The best available science suggests that tailpipe emissions may be responsible for 1 in 5 children who develop asthma.^{xxxiv} Via reduced emissions alone, clean transportation is estimated to prevent 120,000 premature deaths by 2030 and 14,000 annually thereafter in the U.S.^{xxxv} Other studies have shown that the health benefits of lower-emission motor vehicles are increased when combined with the promotion of active travel such as walking or biking, which reduces the prevalence of chronic diseases such as diabetes, dementia, ischemic heart disease, and cancer.^{xxxvi xxxvii} The overall health benefits of such transportation strategies have been shown to save billions in public health spending.^{xxxviii} Comprehensive climate legislation should include expanding public transportation and increasing construction of safe bikeways and walkways, which both reduce greenhouse gas emissions and promote healthy childhood weight through active transportation.

Modernizing the Food System to Reduce its Carbon Footprint

Strategies aimed at shifting food systems to decrease greenhouse gas emissions offer further potential to address environmental concerns while dramatically promoting child health.^{xxxix} The adoption of more plant-based diets in line with current dietary guidelines could reduce global mortality by 6–10% and food-related greenhouse gas emissions by 29–70% by 2050 with global net health benefits from diseases like diabetes, heart disease, stroke, and cancer valued between US\$1–31 trillion.^{xl} In order to realize the full health benefits of such dietary change, evidence suggests that special attention must be given to reducing red meat consumption^{xli} and controlling sugar levels in more sustainable diets.^{xlii} In addition, it is important to support efforts to improve the adaptability and resilience of our food system, through research, development, and implementation of technologies and strategies that promote crop resilience and reduce the greenhouse gas contributions of animal agriculture.

Promoting Sustainable Community Development

Climate change policies that preserve, create, and expand natural green environments directly impact the mental health of populations, with the strongest benefits occurring during childhood. An abundance of evidence suggests the relationship of public green spaces with greater mental wellbeing in a dose-dependent relationship.^{xliii xliiv} Prolonged exposure to green space specifically during childhood has been shown to decrease independently the risk of a wide range of mental illness later in life.^{xlv xlvii} While the exact mechanisms are still being studied, research has shown that exposure to the natural environment decreases harmful thought patterns^{xlvii} and can even impact brain structure and development.^{xlviii} The importance of natural environments early in life has been substantiated with studies showing improved cognitive development and function with increased green space exposure.^{xlix} Adopting urban planning designs that incorporate open green spaces, walkability, reduced dependence on automobile transit, and climate change resilience while minimizing sprawl will decrease emissions while promoting child health.

Prioritizing Health Care Sector Mitigation and Adaptation

The U.S. health care sector is a major contributor to climate change, producing 10% of U.S. greenhouse gas emissions.¹ At the same time, health care systems are contending with consequences of climate change on patients and communities, and health care institutions also play an important role in communities' resilience in the face of climate change related events.

To address the broad array of negative child health effects from climate change, it is essential that federal policies promote energy efficiency and the adoption of clean energy in the health care sector, as well as the adaptation, preparedness, and resilience of hospitals and health systems. Energy efficiency and clean energy can be important components of reducing the cost of health care delivery. We also encourage the development of essential adaptation strategies, and assisting state and local governments, public health agencies, and health professionals in implementation of these strategies. Disaster preparedness and response efforts should include the specific needs of children. National and international policymaking efforts should include extensive input from stakeholders in the health sector, as today's

hearing demonstrates. In addition, we must educate health care providers and vulnerable patients about climate-associated health risks, as well as climate-associated effects on clinical practice—such as management of chronic diseases during periods of extreme heat or poor air quality, and alterations in the safety and efficacy of prescription medications.

Pursuing Additional Adaptation Strategies

In addition to mitigation efforts such as achieving net-zero carbon emissions by 2050, comprehensive climate legislation must include additional adaptation measures to protect children and their families from the effects of climate change that inevitably will occur and are already occurring. These include developing and implementing effective early-warning systems for extreme weather events, and physical protection against those events. Federal policy should also support improved surveillance of climate-associated infectious diseases, including new and emerging pathogens. Finally, we encourage federal policy to promote enhanced community resilience, and an emphasis on redressing the environmental justice concerns climate change presents. Children's safety from climate change should not depend on the color of their skin or the zip code in which they were born.

Making Global Progress through Effective International Diplomacy

Another crucial tool is the use of diplomacy and international cooperation to support global action in response to the climate crisis. The AAP supported the Paris Agreement to engage the global community in emissions reduction targets and has supported the House-passed legislation (H.R. 9) to maintain the U.S. commitment to Paris Agreement's emissions reduction targets. We encourage a focus on upholding U.S. commitments under that agreement as part of any comprehensive legislative response to climate change.

Promoting Response Strategies with Health Co-Benefits

While climate change disproportionately impacts child health, decarbonization efforts also present an enormous opportunity to improve child health by maximizing the co-benefits of carbon pollution reduction. Reducing emissions of hazardous traditional air pollutants such as particulate matter, sulfur oxides, and air toxics along with carbon dioxide can yield greater health outcomes for children. Child exposure to hazardous air pollutants can cause direct health impacts such as neurologic deficits, respiratory tract illness, asthma exacerbations, and decreased lung function,^{li} ^{lii} leading to downstream effects including increased school absences, emergency department visits, and hospitalizations.^{liii} ^{liv} ^{lv} ^{lvi} Studies have also found associations between ambient air pollution and post-neonatal infant mortality,^{lvii} ^{lviii} low birth weight,^{lix} ^{lx} ^{lxi} ^{lxii} and preterm birth.^{lxiii} ^{lxiv} ^{lxv} ^{lxvi} Reducing these pollutants under the Clean Power Plan would have prevented up to 6,600 premature deaths. In addition, it would have resulted in 3,700 fewer cases of child bronchitis, up to 150,000 fewer asthma exacerbations in children, and 180,000 fewer missed school days in the year 2030.^{lxvii} Future decarbonization efforts should prioritize this potential for drastic improvements in child health outcomes through leveraged reductions of multiple pollutants within efforts to reduce greenhouse gas emissions.

Reducing the carbon footprint of other sectors can also yield important child health co-benefits. For example, accessible public and active transportation, plant-based food availability, and green spaces can directly contribute to child health and wellbeing while at the same time reducing carbon pollution. Additional research into the health benefits of various decarbonization strategies could help policymakers choose the smartest investments to maximize co-benefits. The Federal Government currently provides no funding for such research, so directing funding for the research, surveillance, reporting, and tracking of climate-associated health effects would strengthen future comprehensive climate legislation.

Every day, pediatricians confront the growing burden of chronic disease in children. Asthma, obesity, mental health, and long-term health effects related to premature birth are growing issues that we see in clinics across the nation. We have made tremendous progress in addressing these and other threats to children's health, and climate solutions are a way to further prevent some of these conditions or mitigate their severity. Plans for climate change mitigation present a tremendous opportunity to improve child health by maximizing the co-benefits of environmental policies. Policies to promote cleaner air, facilitate active transportation, encourage more sustainable diets, and develop more connected communities can lead to enormous child health gains while preserving a healthy, sustainable environment in which generations of children can thrive.

Conclusion

We appreciate the Committee's efforts to protect children and future generations from the health impacts of climate change. We hope that child health will be a key consideration as you develop any comprehensive legislative response, and we would welcome opportunities to further support and contribute to your work. Thank you again for the chance to testify today, and I look forward to answering your questions.

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Ms. CASTOR. Thank you, Dr. Bole.

Mr. RODRIGUEZ, you are recognized for 5 minutes.

STATEMENT OF ARTURO S. RODRIGUEZ

Mr. RODRIGUEZ. Thank you very much, Chairwoman Castor. Sorry about that. Chairwoman Castor, Ranking Member Graves, members of the Select Committee, thank you for the opportunity to testify today. Today I am representing the United Farm Workers and the United Farm Workers Foundation. While many of us work in climate-controlled environments, farm workers across the Nation work under the scorching sun and during extreme weather events to cultivate and harvest the food that reaches our tables. The dangers farm workers face due to heat exposure will only increase due to climate change.

In addition to heat, farm workers also are on the front lines of exposure to a range of harmful pesticides. Not only is the use of pesticides expected to increase due to climate change, but the way in which farm workers protect themselves from harmful pesticides, such as by wearing extra clothing or personal protective equipment, can increase the risk of heat-related illness.

Of the approximately 2.4 million farm workers across the country, roughly half of farm workers are undocumented and roughly 10 percent are workers here on H-2A visas for temporary agriculture employment. To keep their employers happy and be invited back, H-2A workers will work to the limits of their endurance. The issues I speak of are not hypothetical. The farm worker communities that we serve are intimately and tragically familiar with the

dangers of pesticide and heat exposure, as well as other impacts from climate change, such as wildfires.

Asuncion Valdivia was 53 years old. He died of heatstroke after working for 10 hours in 105-degree temperatures. Instead of calling an ambulance, Valdivia's employer allegedly told his son to drive him home.

Maria Isavel Vasquez Jimenez was only 17 years old. She was working in a vineyard and collapsed after laboring more than 9 hours without access to shade or water. Despite her fiancé's pleas for help, no paramedics were summoned.

Miguel Angel Guzman Chavez was a 24-year-old farm worker that entered the country under the H-2A temporary agricultural worker program. He was picking tomatoes in the State of Georgia and died from heat on June 21st, 2018, a few days after his arrival to the United States.

A string of heat deaths drove us to take action. We worked with Congresswoman Judy Chu and helped convince then Governor Arnold Schwarzenegger to issue the first heat standards in the Nation in 2005 protecting farm workers and other outdoor workers from extreme temperatures.

Later, in 2015, we worked with Governor Jerry Brown to strengthen the rules and ensure more effective, timely, and consistent enforcement of the heat standard. The standard requires that workers are provided with very basic yet lifesaving protections: cool water, shade at 80 degrees, high heat procedures at 95 degrees, and monitoring of workers, training to identify and prevent heat illness. While the road to implementation and enforcement of the California standard has not been easy, the standard has secured meaningful improvements for farm workers and resulted in a notable reduction in the number of farm worker deaths related to heat hazards.

Behind me today is Pablo Martinez, who has worked in the fields of Monterey County since he was 13 years old. As a farm worker and a son of farm workers, Pablo witnessed several of his coworkers pass out due to heat illness. Before the existence of the standard, farm workers would carry the affected workers and try to find a tree or anywhere that could offer them refuge from the sun. Nowadays, and with access to water, shade, rest, training, and emergency procedures, he can attest to the difference that the heat standard makes in the lives of the people that feed us.

California is the leading agricultural State in the Nation, home to the largest number of farm workers in the U.S., a testament to the feasibility of a national heat illness standard to protect outdoor workers and a prime example that implementing commonsense heat illness protections is good for workers, employers, and for our food system.

Since the standard went into effect, California's farming industry has continued to prosper. In fact, from 2008 to 2018, the State experienced a nearly 34 percent increase in cash receipts for all agricultural commodities. The only way we can ensure that Maria Isavel, Asuncion, Miguel Angel, and others didn't die in vain is by protecting the workers most vulnerable to the impacts of climate change with a national heat illness standard.

We stand ready to work with members of this committee and beyond to stop unnecessary illnesses and deaths and advance national safeguards to protect the most vulnerable workers in communities from the impacts of climate change. Thank you very much.

[The statement of Mr. Rodriguez follows:]

Testimony of Arturo S. Rodriguez on behalf of the UFW Foundation and the United Farm Workers of America

**Before the Select Committee on the Climate Crisis,
United States House of Representatives**

**“Creating a Climate Resilient America:
Overcoming the Health Risks of the Climate Crisis”**

February 5, 2020

Chairwoman Castor, Ranking Member Graves, and Members of the Select Committee:

My name is Arturo Rodriguez and I had the honor of serving as the elected President of UFW for over 25 years, until 2018. Thank you for the opportunity to represent the United Farm Workers (“UFW”) union and the UFW Foundation.

Founded in 1962 by Cesar Chavez, Dolores Huerta, and other early organizers, the UFW is the nation’s first enduring and largest farm worker union. The UFW is a labor organization that represents migrant and seasonal farm workers in various agricultural occupations. Through collective bargaining, worker education, state and federal legislation, and public campaigns, the UFW seeks to improve the lives, wages, and working conditions of agricultural workers and their families. The UFW Foundation—a non-profit sister organization of the United Farm Workers Union—provides critical services and resources to farm worker and immigrant communities. As the largest Department of Justice accredited immigration legal service provider in rural California, UFW Foundation regional offices annually serve over 100,000 immigrants.

The UFW and the UFW Foundation believe that the workers who harvest the food that this nation enjoys should be entitled to protection from the impacts of climate change and efforts to undercut such protections. Both organizations actively champion legislative and regulatory reforms that advance the health, safety and well-being of farmworker and immigrant families, rural communities, and beyond. For decades, we have been fighting to correct the historical inequities that penalized farm workers with weaker protections than workers in other industrial sectors. At the federal level and in the state of California, we have fought for laws and regulations that provide life-saving protections for farm workers, agricultural communities and consumers across the country. Among them:

- The Farm Workforce Modernization Act (H.R.5038), a groundbreaking and bipartisan bill that will legalize our nation’s farmworkers, reform the H–2A temporary agricultural worker program and require employment verification (“E-verify”) in agriculture. On December 11, 2019, this bill passed the House of Representatives with overwhelming and bipartisan support (by a vote of 260-165) and awaits action by the Senate.
- The Agricultural Worker Protection Standard (“WPS”) which was strengthened on November 2, 2015 and protects approximately 2.4 million agricultural workers, their families, and communities adjacent to pesticide applications, from pesticide exposure and poisoning.
- The Certification of Pesticide Applicators (“CPA”) rule which protects nearly 1 million pesticide applicators and prevents injuries, illnesses, and deaths from the misuse of deadly pesticides in agricultural, residential and commercial settings.
- A California law—the first in the nation—that was signed by Governor Brown on September 12, 2016 and guarantees farm workers overtime pay after eight hours of work.
- And critically relevant to today’s hearing, the California Heat Illness Prevention standards—implemented in 2005 and strengthened in 2015—designed to prevent deaths and illnesses from extreme heat for workers in agriculture and other outdoor industries.

OVERVIEW OF THE U.S. FARM WORKER POPULATION

As you examine the role of Congress and the federal government in protecting outdoor workers from the risks of climate change and heat exposure, it's important that you understand the many challenges faced by farm workers—whose skilled work is integral to our food system—and the impediments they continue to face in securing the legal right to a safe workplace.

- Overall, there are approximately 2.4 million farm workers across the country. This number includes hundreds of thousands of minors who work in agriculture.

- Out of the 2.4 million farmworkers, in FY 2019, the U.S. Department of Labor certified over 250,000 positions requested by agricultural employers for workers to enter the country with H-2A visas.ⁱ Under the H-2A temporary agricultural worker program, workers depend on the employer that petitioned them for their job, ability to stay in the country, housing and transportation. To keep their employers happy and be invited back, H-2A workers will work to the limits of their endurance.

- Farmworkers are predominantly of Latino and/or indigenous ancestry with nearly 70% hailing from Mexico. About 50% of the workforce is documented, and nearly 80% are most comfortable speaking in Spanish.

- For farmworkers in California, extreme weather events and wildfires are not hypothetical scenarios found in scholarly articles or climate change reports. Indeed, research indicates that rising temperatures and changes in precipitation will increase the risks of wildfires and poor air quality.ⁱⁱ Over the past 3 years, farmworkers across California have first-hand experience performing back-breaking work while fires raged and smoke made it difficult to breathe. Unless they were represented by a union, many of them felt pressured to keep working, despite harmful conditions.

- In addition to heat, farm workers are also on the frontlines of exposure to a range of pesticides that threaten their health and the development of their children. Due to climate change, high temperatures, changing patterns of precipitation and drought are expected to result in a decline in food production, more intense wildfires, a decrease of water supplies, and an expansion of pest activity that will increase the exposure of farmworkers to harmful pesticides.ⁱⁱⁱ In order to protect themselves from the sun and reduce exposure to pesticides, farmworkers wear additional clothing or personal protective equipment (“PPE”) which can increase the risk of heat-related illness.

- Due to a shameful and race-based history, federal law excludes farmworkers from the same basic labor protections enjoyed by other workers, including the National Labor Relations Act (NRLA), the Fair Labor Standards Act (FLSA), and federal child labor laws and safety requirements.

- As a result of language barriers, immigration status, lack of access to health care, and economic vulnerability, most farm workers won't speak out in the workplace, be adequately informed about occupational and environmental hazards, or have access to timely medical attention when illness or injury strikes.

Today, I have the privilege of sitting before you in a climate-controlled hearing room. In general, farmworkers have no refuge from extreme temperatures as they toil under the scorching sun to cultivate and harvest the food that reaches our tables. Farmworkers feed our families and communities, without regard to region, race, ethnicity, gender, age, ability, or whether we are Democrats or Republicans.

Given the nature of agricultural work, their close relationship to the land and regular exposure to the elements, farmworkers are on the frontlines of the climate crisis that needs to be solved. To give you a better sense of the reality that farmworkers and other outdoor workers face, it would be more fitting for a Congressional hearing to be held outdoors, in full exposure to the elements when the summer temperatures are in full swing.

To feed the nation, farmworkers perform skilled and strenuous work. In the course of that work, they face a range of hazards including but not limited to, heat illness, occupational and residential exposure to a range of harmful pesticides, and cumulative exposure to contaminants in our air and water.

At the national level, farmworkers have the highest rates of chemical exposures and heat-related deaths^{iv} among U.S. workers:

- When it comes to the health and safety risks of workplace heat exposure, outside of California, farmworkers enjoy little to no regulatory protection. Only two states—California^v and Washington^{vi}—have implemented standards to protect outdoor workers from heat stress. As such, farmworkers suffer heat-re-

lated illnesses that can lead to heat stroke and death in the absence of training, life-saving precautions and timely intervention.

- In connection with pesticide exposure, farmworkers are denied the health and safety protections provided by the Occupational Safety and Health Administration (OSHA), even though the impetus behind the establishment of OSHA in 1970 was the growing concern in Congress about “the occupational hazard presented by the misuse of pesticides.”^{vii}

If any of us had to spend several hours toiling under high temperatures or exposed to pesticides, the basic protections that we’d need would include water, shade, breaks, training and personal protective equipment to prevent illness and tragedies. Farmworkers deserve nothing less. Given the conditions that they must labor under, protecting farmworkers from the impacts of climate change can be achieved through commonsense safeguards that take into account the realities they face in agricultural occupations, across the nation.

The farmworker communities that we serve are tragically familiar with the dangers of rising temperatures and dangerous heat. We are humbled to be here on behalf of farm workers who died from the heat while harvesting America’s food. They perished as they were denied the drinking water, shade, breaks and other simple measures that could have prevented their deaths:

- **Miguel Angel Guzman Chavez** was a 24-year-old farmworker that came to the U.S. under the H-2A guest worker program. He died from heat on June 21, 2018, five days after he arrived in the U.S. from Mexico. He was picking tomatoes for Beiza Farm Labor Contractor and Motley Farms in the state of Georgia. According to co-workers, Miguel Angel and his crew were working 16 hour days prior to the day he perished. He wasn’t used to the high heat and humidity, and was stricken at the height of the daily heat at about 4 p.m. while picking tomatoes. That day, the high temperature was 95, with a heat index (how hot it really feels when relative humidity is factored in along with the actual air temperature) of 103 or 104 degrees. Miguel had told his crew boss he was feeling ill. The foreman told him to sit it out in the shade. Meanwhile, Miguel yelled and moaned of pain and demanded medical attention. After one hour of suffering, the foreman finally took Miguel to the labor contractor’s office, where human resources staff was present. However, it was another employee, a mechanic, who drove him to the hospital. He died in route. Like many heat stroke deaths of farm workers, Miguel’s death was preventable.

- **Honesto Ibarra** was a 28-year-old worker that entered the U.S. on an H-2A visa. On August 6th, 2017, he was working on a blueberry farm in Sumas, Washington. His coworkers say that it was a hot day when Honesto started experiencing headaches and told his supervisor on two different occasions that he was not feeling well. Honesto was ignored by his supervisor both times and was told to go back to work. Honesto eventually collapsed and was transported to a medical center where he died.

- **Ricardo Sotelo** passed away due to heat illness. This past June 30th marked 4 years since his death. While Ricardo was harvesting blueberries at Olsen Bros, Wyckoff Farms in Washington State, the temperature was 107 degrees. Because of the high temperatures, many of his co-workers were feeling ill and began to vomit. Ricardo had been feeling sick all day and had asked to take a break, but unfortunately he was denied rest by his supervisor and had to continue picking blueberries. Later that day, when Ricardo arrived home from work, he passed out. His family took him to the hospital, where he died on the same day. Medical records indicated that his death was due to heat stroke.

- **Jaime Nuño-Sanchez** was a 48 year-old farm worker with 30 years of experience harvesting fruits and vegetables throughout the Coachella Valley in Southern California. On the morning of September 21st, 2015, he started his shift picking lemons for Wonderful Citrus, one of the largest citrus distributors in the United States. Around 10:30 a.m. on Sept. 21, a work crew that included Nuño-Sanchez and his wife began picking from a row of trees at the back of the grove, not far from where a supervisor had set up shade and water to comply with California’s heat illness prevention standards. Temperatures hovered around 90 degrees, but the humidity made it feel like 105. Forty-five minutes into the shift, Nuño-Sanchez, 48, sat down in a shaded area, saying he didn’t feel well. Minutes later he collapsed. One picker, who could speak English, called 911. A supervisor jumped into a pickup and sped to Highway 86 to wait for a fire truck and paramedics. When they arrived, he led them to the last lemon tree in the grove. Paramedics tried to revive Nuño-Sanchez, but it was too late. The father of three died in the field at 12:35 PM.

- **Maria de Jesus Alvarez Bautista** was 63 years old and worked at Anthony Vineyards, employed through farm labor contractor Manuel Torres. On July 15, 2008, on a 110-degree day, she was picking grapes in the vineyard. The foreman pressured the crew to work harder, telling them they were not working fast enough. According to her family, Maria felt pressured to keep pace with her coworkers, although she needed a break. As a result, she worked for the rest of the day. The crew of 150 people were not provided shade, nor were they trained in heat stroke prevention and precautions as mandated by state law. Without the proper training, her coworkers were not able to identify the signs of heat illness. Later that evening when she was home, she had a headache, a high fever and started vomiting. Her son found his mother wrapped up in a blanket on the sofa, saying she was cold, despite it being a hot day. With her condition deteriorating rapidly over the course of two weeks, she was taken to the hospital on July 29. Doctors determined that she was severely dehydrated and had suffered a heat stroke. After being treated at two different hospitals, Maria de Jesus Alvarez Bautista died on August 2, 2008, making her one of six farm workers whose death was due to fatal exposure to heat in 2008.

- **Maria Isavel Vasquez Jimenez** was a 17-year-old undocumented farm-worker who worked at a vineyard owned by West Coast Grape Farming located east of Stockton, California. She died of heat exhaustion on May 16, 2008. Two days prior to her death, she was tying grape vines when the temperature rose above 95 degrees. She was unable to reach a water cooler that was about 10 minutes away and the foreman didn't give workers a long enough break to get a drink of water. She collapsed from heat exhaustion after working more than nine hours under oppressive heat conditions. She didn't have access to shade or water and she was never trained on heat illness protection. Two days after collapsing from heat exhaustion she passed away. As Bautista, her fiancé, cradled her, the supervisor just stared at her and did nothing. The farm labor contractor failed to bring Maria Isavel to a hospital right way. Instead, the supervisor told Bautista to lay her down in a bed of a hot van and place a wet cloth on her forehead. When she was finally taken to a hospital near Lodi, approximately two hours after collapsing, Maria Isavel was in a coma and her body temperature was about 108 degrees. Then the doctors discovered she was two months pregnant. Bautista said that Maria and him had not been given safety training and that the supervisors had told him to lie about the event.

Maria Isavel Vasquez Jimenez, Maria de Jesus Alvarez Bautista, Jaime Nuño-Sanchez, Ricardo Sotelo, Honesto Ibarra and Miguel Angel Guzman Chavez, were not agricultural implements; they were important human beings. Their lives were worth a lot—and they deserve better treatment than they received.

PROTECTING WORKERS FROM HEAT IS FEASIBLE AND CALIFORNIA SERVES AS A MODEL

After a string of heat deaths, in 2005 the UFW worked with then Assemblywoman Chu and convinced Governor Arnold Schwarzenegger to issue the first comprehensive regulations in the nation to protect California farm and other outdoor workers from dying or becoming ill when temperatures soar. After Representative Chu held a hearing outdoors to highlight the impacts of extreme heat on workers, Gov. Schwarzenegger announced an emergency heat illness prevention standard. California became the first state in the nation to issue life-saving and comprehensive Heat Illness Prevention standards for outdoor workers.

Since 2005, California has required:

- Training for all employees and supervisors about heat illness prevention.
- Potable water to employees that is free of charge and located close to the areas where employees are working
 - Water cannot be more than 400 feet away
 - Each employee should have access to 1 quart per hour, or four 8 ounce glasses of water per hour
- Access to shade and encourage employees to take a cool-down rest in the shade for at least 5 minutes. They should not wait until they feel sick to cool down.
- Planning that includes written procedures for complying with the Cal/OSHA Heat Illness Prevention Standard.

The laws on the book are only meaningful if they are enforced and become a reality for the workers that need it the most. In the summer of 2008, five more farm workers died from heat illness in California. Their deaths inspired our organizing of the "March for Fallen Farm Workers" from Lodi to the state Capitol in Sacramento to raise awareness about agricultural establishments and farm labor con-

tractors who were denying farm workers the life-saving protections inherent in the state's Heat Illness Prevention Regulation.

In light of these tragedies, the UFW helped aggrieved farm workers challenge the state of California in 2009 and 2012 over inadequate enforcement of heat regulations. In 2015, a settlement of these complaints led the state of California to increase their enforcement of the heat standard and included a memorandum of understanding under which farm worker advocacy groups, including the UFW and the UFW Foundation, can file reports of violations with Cal-OSHA, which is mandated to immediately investigate them.

Furthermore, on Friday, May 1, 2015, the state issued strengthened heat regulations for all employees that work outdoors throughout California. The strengthened rules require that:

- Water provided to employees must be “fresh, pure, suitably cool” and located as close as practical to where employees are working.
- Shade must be present at 80 degrees, instead of the current 85, and accommodate all employees on recovery or rest periods, and those onsite taking meal periods.
- High-heat procedures (which will remain triggered at 95 degrees) shall ensure “effective” observation and monitoring of employees.
 - During high heat, employees must be provided with a minimum 10-minute cool-down period every two hours.

Since the CA standard went into effect, California's farming industry has continued to prosper. In fact, according to the most recent farm income and wealth statistics by the CA Department of Food and Agriculture, from 2008–2018, the state experienced a nearly 34 percent increase in cash receipts for all agricultural commodities, compared to 2008.^{viii}

California is the leading agricultural state in the country, producing over 400 commodities, two-thirds of the nation's fruit and nuts, and more than one-third of the nation's vegetables. It is also home to the largest number of farmworkers in the U.S.^{ix}

California's size (the third largest state by land area and most populated state in the country),^x diverse temperature zones, and the various outdoor industries that are subject to the California Heat Illness Prevention Standard (agriculture, construction, landscaping, oil and gas extraction, and transportation or delivery of agricultural products, construction materials or other heavy materials)^{xi} can serve as a model for the nation, and a testament to the feasibility of a national heat illness standard to protect workers.

It's important to note that in testimony before Congress, among many things, the California Farm Bureau Federation shared that the California Heat Illness Prevention Standard is simple; that any heat standard should require provision of water, shade, and training for everyone, and that “the greatest need is for workers, supervisors and employers to understand the key steps to take to avoid incidents of heat illness and deal effectively and promptly with any incidents that occur.”^{xii} All these basic efforts intend to save more lives and prevent more illnesses among outdoor workers.

PERSONAL PROTECTIVE EQUIPMENT (PPE) IS INADEQUATE TO PROTECT FARMWORKERS FROM UNSAFE LEVELS OF PESTICIDES AND EPA IS NOT CONSIDERING HOW CLIMATE CHANGE AND PPE USE AFFECT THE RISK OF HEAT ILLNESS.

A bedrock principle of occupational hygiene is the “hierarchy of controls,” which is used by the Occupational Safety and Health Administration (OSHA) and others to identify options for controlling exposures to occupational hazards. The hierarchy prioritizes elimination of the hazardous agent or substitution of a less hazardous agent. These are preferable to the implementation of engineering controls, which in turn are preferable to requiring personal protective equipment. For workers who are protected by OSHA, personal protective equipment is always the mitigation measure of last resort. When it comes to protecting workers from pesticides, EPA is in charge and the agency starts by considering personal protective equipment, then considers engineering controls, and never considers substitution with less toxic options or practices.

However, when EPA reviews a pesticide to determine whether it meets the statutory safety standards, it conducts a series of risk assessments addressing food, drinking water, drift and volatilization exposure to children, bystanders, and workers. As its standard approach in assessing worker risks, EPA identifies risk levels of concern to workers and determines whether workers will be exposed to levels of pesticides that exceed those risk levels. For pesticide handlers, if it finds risks of

concern, EPA first tries to reduce the risks through the use of protective clothing and gear. If the risks of concern are not eliminated, EPA then considers requiring engineering controls, like closed mixing systems. If none of these strategies eliminates the risks of concern, EPA will consider reducing application rates or eliminating the application method. For risks of concern to field workers, EPA uses restricted re-entry intervals to keep field workers out of the fields until exposures will be reduced. Only if re-entry intervals cannot eliminate the risks of concern will EPA consider stopping the activity or the use of the pesticide. This is the inadequate and underprotective methodology that EPA has used to assess worker risks from some of the most harmful pesticides.

Furthermore, while the Environmental Protection Agency (“EPA”) has acknowledged that use of PPE when working in hot temperatures increases the risk of heat-related illness, unfortunately, EPA does not evaluate this risk when conducting occupational risk assessments for pesticides that assume varying levels of personal protective equipment.

Feeding America and much of the world is honorable and important work. Farm workers shouldn’t risk death or illness from climate change impacts and pesticide exposure when reasonable measures can prevent such tragedies and protect them from these hazards.

Fifteen years ago we got a Republican governor to take action on heat stress. Five years ago we worked with a Democratic governor to strengthen the heat standards. Last year, we worked together to secure the enactment of S. 483, the Pesticide Registration Improvement Act of 2019 (“PRIA 4”) and passage of the Farm Workforce Modernization Act (H.R. 5038) in the House:

- House and Senate leadership, congressional appropriators and authorizing committees (House and Senate Agriculture, and House Energy and Commerce) unanimously supported S. 483. PRIA 4 provides the EPA with more resources to evaluate pesticide registrations and ensures the protection of farmworkers, pesticide applicators and consumers who are exposed to pesticides in agricultural, residential, and commercial settings.
- H.R. 5038 is a bipartisan bill that would not only legalize eligible farmworkers but also requires that agricultural employers of H-2A workers maintain a heat illness prevention plan that includes: procedures for the prevention of heat illness, appropriate training on heat illness prevention, access to water and shade, the provision of breaks, and protocols for emergency response. This was part of an effort to bring the life-saving heat illness protections that we helped establish in California to farmworkers across the nation.

SOLUTIONS TO THE CLIMATE CRISIS REQUIRE BOLD ACTION

Farm working and immigrant families are not only vital to our economy and food security; they are also vital to our communities. As this Committee and Congress discuss the bold action that will be necessary to tackle the climate crisis, I urge you not to lose sight of the relief and safeguards that farmworkers and environmental justice communities deserve NOW, to live and work with dignity and free of occupational and environmental hazards that threaten their health, safety, and the well-being of their families.

To this end, we urge members of this committee to ensure that any policies, recommendations and strategies to address the climate crisis count with the meaningful engagement of the workers and communities who are on the frontlines of the climate crisis. Doing so would be consistent with the principles of Environmental Justice, which among many things: demand the participation of the most impacted communities at every level of decision-making; and affirms the right of all workers to a safe and healthy work environment.^{xiii} On this front, I want to commend the work of Congressman McEachin and Natural Resources Committee Chairman, Raúl Grijalva on their comprehensive environmental justice initiative and the Environmental Justice for All Act. Environmental justice stakeholders have described the initiative as the most participatory effort of any Congress.

FOR SOLUTIONS THAT ARE CENTERED ON THE WORKERS MOST VULNERABLE TO THE CLIMATE CRISIS, AT A MINIMUM, CONGRESS MUST:

- **CODIFY the right to water, shade, rest, training and emergency procedures for outdoor workers.** These are basic yet life-saving safeguards that would protect outdoor workers from heat related illnesses and deaths. This is what the Asuncion Valdivia Heat Illness and Fatality Prevention Act (H.R. 3668) intends to do by directing the Occupational Safety and Health Administration (OSHA) to issue a standard to protect indoor and outdoor workers

from heat-related injuries and illnesses. If enacted, the bill can ensure that workers like Asuncion, Maria Isavel, Miguel Angel and Honesto won't die unnecessarily.

- **ELIMINATE the racist exclusion of farmworkers from our federal labor laws.** U.S. farmworkers who seek improvements in wages or working conditions can be fired by their employers if they choose to join, organize or support a labor union. That is not the case for workers in other industry sectors that count with federal protections provided by the National Labor Relations Act of 1935 (NLRA), which among many things, prohibits employers from firing workers for the aforementioned activities. The disparity in protections is due to a legacy of racism that specifically excludes farmworkers (and domestic workers) from the NLRA. And the exclusions don't end there. In fact, farmworkers are also excluded from the right to overtime pay in the Federal Labor Standards Act of 1938 (FLSA). The Fairness for Farm Workers Act (H.R. 1080) would end the discrimination that denies farmworkers the right to overtime pay.

- **DIRECT THE EPA to assess the risks of heat-related illness** associated with any and all personal protective equipment (PPE) that the Agency assumes that workers will wear when conducting occupational risk assessments for pesticides. While the Agency has acknowledged that use of PPE when working in hot temperatures increases the risk of heat-related illness, the EPA does not evaluate this risk when conducting occupational risk assessments for pesticides that assume varying levels of PPE.

- **DIRECT THE EPA to follow the hierarchy of controls** when selecting options to reduce occupational risk from pesticides. A bedrock principle of occupational hygiene is the "hierarchy of controls," which is used by the Occupational Safety and Health Administration (OSHA) and others to identify options for controlling exposures to occupational hazards. The hierarchy prioritizes elimination of the hazardous agent or substitution of a less hazardous agent. These are preferable to the implementation of engineering controls, which in turn are preferable to requiring personal protective equipment. For workers who are protected by OSHA, personal protective equipment is always the mitigation measure of last resort. When it comes to protecting workers from pesticides, EPA is in charge and the agency starts by considering personal protective equipment, then considers engineering controls, and never considers substitution with less toxic options or practices.

- **DIRECT ALL FEDERAL AGENCIES to comply with Executive Order 12898** relating to Federal Actions to Address Environmental Justice In Minority Populations and Low-Income Populations, and report to Congress on its implementation. EO 12898 directs Federal agencies to address disproportionately high and adverse human health or environmental effects of its programs. Failure to implement EO 12898 is of great concern as it will disproportionately and negatively impact members of the UFW and UFW Foundation who are farm worker families, low-income immigrants, immigrants with disabilities and persons of color.

- **INVEST in the capacity of rural and agricultural communities to:**

- **Resist and respond to climate change impacts.** Agricultural communities are particularly vulnerable to climate change and pesticide exposure. Compared to urban areas, rural areas have higher concentrations of people that live in poverty and are more likely to have limited access to medical services and housing with air-conditioning.^{xiv} This affects the ability of farmworker families to find refuge from the heat in their own homes and get treatment for heat-related illnesses or injuries. Failure to prepare the agricultural sector for the impacts of climate change will compromise our food security, and the health, safety and livelihoods of farmworkers.

- **Decrease the agricultural industry's reliance on harmful pesticides.** In the United States, over 1.1 billion pounds of pesticides are used every year. World pesticide usage is at nearly 6 billion pounds, according to EPA estimates.^{xv}

We stand ready to work with Republicans and Democrats in this committee, and beyond, to stop unnecessary illnesses and deaths, and advance national standards that protect the most vulnerable workers and communities from climate change.

ⁱ See U.S. Department of Labor, Employment and Training Administration, Office of Foreign Labor Certification, "H-2A Temporary Agricultural Labor Certification Program—Selected Statistics, FY 2019, available at https://www.foreignlaborcert.doleta.gov/pdf/PerformanceData/2019/H-2A_Selected_Statistics_FY2019_Q4.pdf.

ⁱⁱ See U.S. Global Change Research Program, Fourth National Climate Assessment (2018), available at https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf.

ⁱⁱⁱ *ibid.*

^{iv} See Larry L. Jackson & Howard R. Rosenberg, Preventing Heat-Related Illness Among Agricultural Workers, 15 J. Agromedicine 200 (2010) (“The crop worker fatality rate averaged 4 heat-related deaths per one million workers per year—20 times higher than the 0.2 rate for US civilian workers overall.”).

^v See 8 CCR § 3395, 8 CA ADC § 3395, Heat Illness Prevention in Outdoor Places of Employment, available at <https://www.dir.ca.gov/title8/3395.html>.

^{vi} See WAC § 296-62-095, Outdoor Heat Exposure, available at <https://app.leg.wa.gov/WAC/default.aspx?cite=296-62&full=true#296-62-095>.

^{vii} See *Organized Migrants In Community Action, Inc. v. U.S. Department of Labor* (1975) at <https://law.resource.org/pub/us/case/reporter/F2/520/520.F2d.1161.74-2062.html>.

^{viii} USDA/ERS Farm Income and Wealth Statistics, Cash receipts by commodity 2008–2019F, available at https://data.ers.usda.gov/reports.aspx?ID=17845#P5f4072bb859f4ffc99c413a4eee73e71_4_17iTO0x5.

^{ix} USDA, National Agricultural Statistics Service, 2017 Census of Agriculture, State Data, Table 7. Hired Farm Labor—Workers and Payroll: 2017, available at https://www.nass.usda.gov/Publications/AgCensus/2017/Full_Report/Volume_1,_Chapter_2_US_State_Level/st99_2_0007_0007.pdf.

^x See U.S. Census Bureau, Quick Facts: California; United States, available at <https://www.census.gov/quickfacts/fact/table/CA,US/PST045218#>.

^{xi} 8 CCR § 3395, 8 CA ADC § 3395, Heat Illness Prevention in Outdoor Places of Employment, available at <https://www.dir.ca.gov/title8/3395.html>.

^{xii} See testimony by Bryan Little before the House Education and Labor Committee at <https://edlabor.house.gov/imo/media/doc/LittleTestimony0711191.pdf>.

^{xiii} Delegates to the First National People of Color Environmental Leadership Summit held on October 24–27, 1991, in Washington DC, drafted and adopted 17 principles of Environmental Justice. The Principles have served as a defining document for the growing grassroots movement for environmental justice, available at <https://www.ejnet.org/ej/principles.pdf>.

^{xiv} See U.S. Global Change Research Program, Fourth National Climate Assessment (2018), available at https://nca2018.globalchange.gov/downloads/NCA4_2018_FullReport.pdf.

^{xv} See U.S. EPA—Pesticides Industry Sales and Usage 2008–2012, available at https://www.epa.gov/sites/production/files/2017-01/documents/pesticides-industry-sales-usage-2016_0.pdf.

Ms. CASTOR. Thank you very much.

And all of your testimony was very helpful and elucidating.

Ms. Brownley, I understand you have to get to another hearing. So I am going to recognize you first for questions for 5 minutes.

Ms. BROWNLEY. Thank you. Thank you, Madam Chair.

And thank you all of our witnesses for being here with your powerful testimony.

Mr. Rodriguez, I wanted to start with you. I know you know my district, Ventura County—actually, Ventura County has experienced the greatest temperature increase of any county in the continental United States, and the basis of Ventura’s economy is agriculture and the work that your farm workers do in our county. And you mentioned the issues around pesticide and heat exposure, and I would add one more thing to that, and that is farm workers’ children. As a former school board member, I know that asthma’s the number one cause for children to miss school and when we talk about environmental justice, it is the children of farm workers, I think, that are most affected by that and the stress it brings, the mental health stress that that brings, but also the care for their children, and they are required to be home with their children and probably can’t be home with their children.

So I just—I guess the first question I really have is, is UFW collecting any data on health impacts of farm workers? Do you have hard data on that? Is it something that you are collecting?

Mr. RODRIGUEZ. You know, unfortunately, we don’t have any hard data, but we work very closely with the Robert F. Kennedy medical plan, which is a medical insurance plan that we founded, that Cesar Chavez founded back in the late 1970s when we first began to get our contracts, and through that, we have noticed in terms of the types of illnesses that farm workers experience. Unfortunately, we haven’t been able to detect it all the way down to the

children, but we are working now with other universities in Fresno County and other researchers to really measure what is the impact on farm workers, on their children as a result of not only climate change, but you mentioned the very important thing, the pesticides. Because in addition to the fact that farm workers are exposed to the heat and everything else, they wear a lot of clothing to protect themselves, and oftentimes that comes in contact with the pesticides that are used on the various crops out there. And too often, as soon as they get home, the children come to hug them before they have had the chance to take off their clothes and so forth and get exposed to those pesticides, but we know it definitely has had a serious impact on Ventura County and all of the rest of the major agricultural counties there in the State of California. Thank you.

Ms. BROWNLEY. Thank you, sir.

And, Dr. Bole, you know, as it relates to children, again, mentioning that asthma is the number one cause for children to miss school, but I am also very concerned about their mental health. Again, in my district in Ventura County, we have had two of California's largest wildfires in its history, and so I have seen the stress on families who have lost their homes and particularly their children. And schools and school sites are having to sort of rethink how they address these issues. And still these fires were a couple of years ago, but you can't go to a school campus or anywhere without first talking about the impacts of those fires. People are still talking about it and trying to work through it.

So I guess my question to you is, you know, how do we need to rethink the mental healthcare in this country as it relates specifically to climate and climate change?

Dr. BOLE. Thank you for the question. Just briefly, I would like to comment on the fact that, for children of farm workers, it is important to point out that extreme heat is a factor in asthma exacerbations itself but also in birth outcomes. So preterm birth and extreme heat are related. So I just want to point out that our pregnant farm workers and young children and those teenagers who are outside are at risk for multiple reasons. So I appreciate you pointing that out.

On the topic of mental health, I think it is a really important one. And when we think about young children who are dependent on adults for their daily needs, dependent on a healthy community infrastructure for their ability to grow and thrive, these lasting mental health impacts of extreme weather events, whether it is wildfires or storms in the southeast, we have increasing data that the post-traumatic impacts really interfere with children's ability to grow, develop, and learn. And so to be able to be prepared for that response and also to help children sort of cope with their fears about the future and I think climate action that is hopeful, solution-oriented, and urgent has to be part of addressing children's mental health needs at this time. So thank you for that question.

Ms. BROWNLEY. Thank you, Madam Chair.

I yield back as well.

Ms. CASTOR. Mrs. Miller, good morning. You are recognized for 5 minutes.

Mrs. MILLER. Good morning, and thank you, Chair Castor, and Ranking Member Graves who isn't here, for having everyone here and thank you all for taking the time to be with us today.

A few years back, West Virginia made an attempt to require major energy utilities to have at least 25 percent of their energy come from renewable sources by 2025. This shift resulted in high energy cost where many had to make decisions about keeping the lights on or getting necessities, like prescription drugs and food, putting food on their table, and the legislation finally was subsequently repealed.

I can remember retired school teachers who are living on hundreds of dollars a month, and it was really very difficult for them. Our witness, Mr. Hollie, who, unfortunately, was unable to be here today, discussed the prevalence of energy poverty. I have seen energy poverty with my own eyes, within my own community, and the negative impacts that it has on health, economics, and more. As I have said in this committee before, it is important, it is so important for us to be good stewards of our environment. However, that does not mean that we need to completely get rid of key, inexpensive base load energy. Innovative technology like carbon capture, the science is there. They can help reduce emissions for the base load energy year-round no matter what the weather is.

Dr. Bole, when we have extreme weather events in the United States, we need to ensure that our Nation's hospitals are prepared and can support the influx in energy consumption in an efficient way to provide for continuity in care. How important is reliable base load energy to provide energy for hospitals during an extreme weather event?

Dr. BOLE. Thank you for the question. Certainly, the resilience of our healthcare facilities is something that is extremely important, and we are finding that combining energy efficiency—really aggressive energy efficiency measures are incredibly important for enhancing our resilience as a healthcare system in this country, as well as a lot of really innovative strategies around, for example, combined heat and power, other kinds of mixed sourcing of energy that is really kind of advancing healthcare facility resilience, something that we are seeing come into play. Increasing number of hospitals are understanding climate action to be a really important part of our ability to remain resilient in this time of changing climate.

So you are absolutely right that reliable energy is incredibly important for hospitals during times of crisis, and we know that investing in efficiency, transitioning to renewable energy is sort of part of the solution. And increasingly the healthcare sector is playing a leading role in that transition.

Mrs. MILLER. I live near a hospital, and I feel very fortunate because, when we do have extreme weather, say, a terrible snow or ice that affects people's electricity, mine is still on. But I know the time when we will be in complete darkness, you can still see that hospital with the lights on and what a secure feeling it gives you. How can we ensure energy remains reliable during influxes of consumption?

Dr. BOLE. I think that question goes beyond hospitals; it goes to communities. And so, if I may, I invite some of my other fellow

panelists to comment because your question I don't think is confined to hospitals. I will tell you, as I said, that, depending on the region, that hospitals are employing a variety of different strategies, and we are finding increasingly there are hundreds of hospitals committing to efficiency, to increased renewable sourcing, to strategies that can really help mitigate the root causes of climate-related events that are becoming more and more frequent that threaten our ability to serve the patients who need us the most.

Mrs. MILLER. Well, I have only got one more minute and I have two more questions. The select committee has discussed a lot about resilience and how important it is that we ensure our Nation's infrastructure is prepared for extreme weather events, and how resilient do you feel that our Nation's health systems are?

Dr. BOLE. I think we are very fortunate that our healthcare sector and healthcare leaders have been very engaged in disaster preparedness for a very long time. Many of my pediatric colleagues are very active in that space. So I think that we have made a lot of advances around healthcare facility resilience, and we continue to do that. I think what we need to do is really incorporate climate-change-related events and forecasting about climate-related events, severity and frequency in our disaster preparedness. And I would say centering a child's health and the ability to continue to deliver pediatric health services in this changing climate is going to be incredibly important for our disaster preparedness efforts going forward.

Mrs. MILLER. Have you seen the impacts of energy poverty in children who seek medical care?

Dr. BOLE. You know, in my State of Ohio, we do see issues with all kinds of resource insecurity, including utility insecurity, and actually home weatherization, energy efficiency, even residential solar generation are all part of a true root cause kind of solution to energy and security in my community. We are seeing that happen every day.

Mrs. MILLER. Thank you.

I yield back.

Ms. CASTOR. Thank you.

Ms. Bonamici, you are recognized for 5 minutes.

Ms. BONAMICI. Thank you, Chair Castor.

Thank you to all of our witnesses.

We know that the climate crisis will disproportionately affect the health and well-being of low-income communities, people of color, children, and older adults. We have a responsibility to take action to address that.

Ms. McCarthy, during your tenure at the Environmental Protection Agency, the social cost of carbon was a foundation of important environmental regulations, including the Clean Power Plan. We had many conversations about that in the Science, Space, and Technology Committee over the years. The social cost of carbon has been used to express the dollar value or cost of climate damage caused by 1 ton of carbon dioxide, and it actually reflects the socioeconomic and ecosystem damages from emissions and helps us translate to the long-term consequences into present value.

Unfortunately, in 2017, President Trump signed an executive order disbanding the Interagency Working Group on the Social

Cost of Carbon. I am concerned that the absence of that analysis is being used to justify or rationalize harmful and regulatory decisions, and I know that Natural Resources Defense Council released a report titled “Bitter Pill: The High Health Cost of Climate Change,” and that report recommended examining how the social cost of carbon could be updated.

So, beyond reinstating the interagency working group, how should Congress incentivize the reinstatement of an accurate social cost of carbon, and how can we support Federal agencies in better quantifying the health damages in a renewed social cost of carbon analysis?

Ms. MCCARTHY. First of all, thank you for the question. We all know that the challenge of Federal agencies is to look at all of the cost and benefits of the actions that it takes. Clearly, the social cost of carbon was established to allow us to understand the full breadth of consequences of the carbon emissions that are fueling climate change and how we can reduce those and account for those in decisionmaking. And you are right. This administration is—has decided to move away from looking at the full cost, but I would also caution you to think about their fundamentally stop looking at climate change period, not just the full breadth of social consequences with our changing climate. And to me that is like a bank statement where you only look at deposits and not withdrawals, and I think that we need to go back and take a look at this.

I do know that people outside of the government continue to look at updates on the social cost of carbon because I think we seriously underestimated those costs, and so I think there will be many people fully prepared to both challenge rules that don’t consider climate change every step of the way, including actions and accounting for the broad social cost. NRDC is one of those.

Ms. BONAMICI. Thank you. I appreciate the panel today helping to highlight that issue. I want to get to Mr. Rodriguez. Your testimony you shared those powerful stories—thank you so much—of the farm workers who felt pressure to keep working in harmful conditions. And as a member of the Education and Labor Committee, I am certainly pleased to support Congresswoman Chu’s bill to adopt a final standard on the prevention of occupational exposure to excessive heat. What additional steps can Congress take to safeguard outdoor workers from heat-related illnesses and death and provide workers with appropriate remedies in the event their rights are violated?

Mr. RODRIGUEZ. For me?

Ms. BONAMICI. Yes.

Mr. RODRIGUEZ. Okay. Sorry. Well, thank you, again, for the question. You know, Congresswoman Judy Chu, my understanding, at least, has already introduced legislation here in Congress.

Ms. BONAMICI. Right. I am proud to cosponsor that.

Mr. RODRIGUEZ. Oh. Fantastic. So we are very hopeful that really that there is going to be support for that legislation, and I was mentioning earlier that, in negotiations this past year, around the immigration bill for farm workers, H.B. 5038, we were actually there sitting down with the agricultural industry with the leaders throughout the Nation. And we discussed this particular issue with them, and I think all of them voluntarily agreed that this is an

issue that we don't have to really look further than what has already transpired and what has taken place, and we included that actually in the legislation. So we are of the mind that the agricultural industry has really recognized the importance of this, and we should all come together at this particular point with Congresswoman Judy Chu's and your bill to be able to really pass that legislation.

Ms. BONAMICI. I hope so. I represent a district in Oregon, your neighbor to the north in California, and I know how important our agriculture community is, and the workers absolutely need to have that protection. One more quick question for Ms. McCarthy, harmful algal blooms you mentioned. We know that is a problem across the country, coastal communities as well as Great Lakes, rivers, streams. The EPA lacks an authorization or adequate appropriations to respond to that. So what resources does the EPA need to adequately respond to the health threats posed by algal blooms, particularly in terms of access to safe and clean drinking water?

Ms. MCCARTHY. It needs a couple of things. One is it needs resources to be able to continue to track and make these harmful algal blooms better visible to people. So transparency is going to be important. But we do—the EPA does have some authority here. Unfortunately, the waters of the U.S.—that is not what it is called anymore, but any ways, whatever was just finalized which looks at what waters are protected, it really has cut the legs out of the ability to be able to look at some of the waters in streams and wetlands that are important to protect, that would eliminate some of the sources of contamination that are causing harmful algal blooms. And let's just very quickly remind ourselves that this isn't just about keeping waters swimmable and fishable; this is directly about drinking water. Those harmful algal blooms created the cyanotoxins that shut down an entire city of Toledo for a 4-day stretch, and we need to remind ourselves that these are issues that are bad for our economies but fundamentally threaten our drinking water.

Ms. BONAMICI. Thank you. I see my time is long expired.

I yield back. My apologies.

Ms. CASTOR. Mr. Graves, welcome. You are recognized if you would like to make some opening comments and then lead into your questions.

Mr. GRAVES. Sure. Thank you, Madam Chair. I want to thank all the witnesses for being here today. I appreciate you being here and appreciate your testimony. We have had a chance to go through your written remarks.

Administrator McCarthy, it is nice to see you, again.

Ms. MCCARTHY. You too.

Mr. GRAVES. I think we did a good bit of work together on the BP oil spill, and I don't think I have seen you since, but nice to see you.

Ms. MCCARTHY. I remember. It is good to see you too.

Mr. GRAVES. I appreciate you being here.

Dr. Bole, this hearing has been about the health impacts of greenhouse gas emissions. If the United States was a party to an agreement that would result in a net increase in emissions, is that heading in the right direction?

Dr. BOLE. Thank you for the question. Can you clarify what you mean?

Mr. GRAVES. Sure. Sure. If we were a party to an agreement that resulted in a net increase, a net increase in emissions, is that—are we heading in the right direction?

Dr. BOLE. Well, I appreciate the question. You know, it is true that climate change is a global problem and requires a global solution. It requires the United States to lead in that space. What I can tell you—and I am not sure if I am quite getting to what you are asking—what I can tell you is that reduction in greenhouse gas emissions has both long-term health benefits for children—so I focused a lot on those long-term health benefits in terms of the effects of increased temperature on things like surface ozone, aeroallergens, changing patterns of infectious disease, but it is important to note that there are also immediate co-benefits of decreasing those emissions, both locally and globally. So some of those local impacts and immediate impacts relate to decreasing particulate emissions from the immediate effects of burning fossil fuels and also creating some of those walkable more active transit-friendly communities that I mentioned in my testimony. So I guess what I am saying is a reduction of emissions has both immediate and long-term benefits. I am not sure if I am fully understanding what you are asking.

Mr. GRAVES. So, if I were to flip that over and an increase in emissions basically is not heading in the direction that, based on your professional opinion, is where we need to be going?

Dr. BOLE. To increase fossil fuel, burning of fossil fuels, is not the right direction, no.

Mr. GRAVES. Well, let's distinguish those, though. It is not—it is not the utilization of fossil fuels; it is the emissions.

Dr. BOLE. Well, it is both. I mean, transitioning to a—maybe I am not following.

Mr. GRAVES. Well, let me—two separate points. I think it is important distinguishing the difference between fossil fuel utilization and emissions. The fossil fuel utilization themselves, that doesn't cause health impacts. It is the impact of the emissions is what your testimony is about and where the concerns are. Let me separate these out and happy to give you more time to answer the second part, but on the first part, the Paris accords that folks are out there touting and saying are great, for every 1 ton of emissions the United States has reduced, China has increased emissions by 4 tons. This is a global issue. It is a global problem, and it is going to require global actions, global solutions. And it is concerning to me when folks talk about the Paris Accords and how great these are whenever the reality is, under the agreement, China was allowed to increase emissions. And it seems contrary to the very direction that I believe everyone up here hopes that we can head in.

The United States has been the world leader in emissions reduction, and we need to continue moving in that direction. And so my point is I just wanted to emphasize that, under the Paris Agreement, China is actually able to increase their emissions by 50 percent through 2030, and to date they have actually quadrupled the emissions increases for every 1 ton—for every one unit of reduction we have had in the United States.

Now moving on to the second point. So many people during this hearing and in testimony, it is—folks are talking about fossil fuels and saying fossil fuels are the enemy; keep it in the ground. The science actually shows that it is the emissions. There are many products, there are many things that we deal with every single day, and, as a physician, you do and—but the deal is, is there are safe ways of handling things. There are ways of neutralizing the adverse constituents, components, or outcomes of that product, and an example is, in the Houston area right now, there is an electricity generation facility known as Net Power. It is natural-gas-fired electricity, meaning it is a natural gas electrification facility, but it has net zero emissions, net zero emissions. So I don't want to confuse fossil fuels—just like we don't throw out the baby with the bathwater and everything else—if we can find ways to utilize those products in a way that reduces or eliminates emissions. In fact, there are some technologies that are being researched now that would be a net reduction in emissions. And so I want to urge everyone, as we think forward in terms of our solutions, let's be careful about how we talk about things and be thoughtful about basically not preventing ourselves from being able to bring real solutions to the table, which would be emissions-free energy technologies such as like what is being done in the Houston area right now.

Madam Chair, I think you may have something to say, if you don't mind, just giving her a few seconds to respond if you wanted to. You looked like you wanted to say something.

Dr. BOLE. I didn't know if you had a question for me about that.

Mr. GRAVES. Well, I think it just goes back to what I was saying earlier. We have got to be careful about separating—oil and gas are just conventional fuel usage—with our objective, which is actually reducing emissions.

Dr. BOLE. I appreciate the point about a variety of different technologies. I am not an engineer. I am a pediatrician. But what I can say is that—I can say, respectfully, is that, in general, a transition to clean and renewable energy for both power generation and transportation is going to be a critical underpinning of protecting children's health, both immediately from the immediate impacts of burning those fuels that create emissions right now, but also in the future.

Mr. GRAVES. That create emissions. And Dr. Bole, I agree. Reducing emissions, I will say it again: I agree with you in regard to that objective. I think we also need to look holistically—and I want to also be clear, I fully support the utilization of renewable energy sources. I think it needs to be part of our portfolio. We need to look at the holistic impact of environmental impact of those, such as the mining impacts in Asia and Africa and other places. We need to look at the limitations on battery storage technology. We need to look at the carbon that is utilized in wind turbines and other products as well to make sure that we understand the full environmental impacts.

Madam Chair, thank you for the liberties there.

I yield back.

Ms. CASTOR. Mr. Levin, you are recognized for 5 minutes.

Mr. LEVIN. Well, thank you, Chair Castor, for holding today's hearing. Very pleased we have the opportunity to discuss the health impacts, and I grew up in southern California where we used to have smog alerts all the time. We got tough and smart. We dramatically reduced air emissions. It is not just greenhouse gas emissions. It is also criteria pollutant emissions, NOX and SOX and particulate matter, and I thank you all for the great work you have done.

Administrator McCarthy, we need you back because I have seen five or six decades of bipartisan progress on working together—The Clean Air Act, Clean Water Act, Endangered Species Act, National Environmental Policy Act: it is all under threat in a way that I never expected. As an environmental lawyer practicing in California where we have had a waiver under the Clean Air Act because we got tough and we got smart on emissions long before it was popular to do so. And now I have a 7-year-old and a 5-year-old, and they are able to breathe cleaner air than I did because of the work that we did. That is all under threat as well, but I wanted to ask a couple of related questions.

My district today in northern San Diego County, South Orange County is feeling the impact of sea level rise in a very profound way, and it is clear to me that the costs of inaction, of doing nothing, far exceed the cost of action as particularly true with regard to health, where, again, if I heard you correctly, ten climate events in 2012 alone drove \$10 billion in healthcare costs. My guest at the State of the Union last night was a gentleman named Dr. Pat Davis who tragically lost his wife, his daughter, and his sister-in-law when a bluff collapsed on them. He was right next to them when a bluff collapsed, and we are seeing unprecedented coastal erosion and all the rest, flooding and fires as we have not seen before in California. We know it is impacted by climate change because the researchers and the science talk about the science. The scientists in my district at the Scripps Institution of Oceanography know that this is directly related to climate change.

So, Ms. McCarthy, Dr. Bole, can you explain some of the most serious public health impacts of sea level rise, coastal erosion, and coastal flooding?

Dr. BOLE. Go ahead.

Ms. MCCARTHY. Let me just start, and it seems awkward that I am answering the health question, but that is okay.

Mr. LEVIN. I think you are qualified to answer any of these questions.

Ms. MCCARTHY. You know, I think it is important to recognize that the challenge you mentioned, which is human lives are being lost immediately as a consequence of our oceans rising and the challenges that we are seeing in these extreme weather events, but what people tend not to think about is, every time you have those flooding events, you are contaminating potentially significant drinking water for a very long time.

And we see that with wildfires happening. The same thing. There are long-term consequences. When you respond, like EPA is required to do in the event of these emergencies, you are responding because we have oil tanks that have flooded. You have systems that don't work. The ability of Congress to move forward with in-

frastructure as you want to do investments is going to be essential for that protection, but each of them has to be designed with climate change in mind.

We have to get real and recognize that 100-year storms when they happen every year are badly named. And we have to get real and address these issues because it is not just an extreme weather event and what happens that day, but it is the consequence of year after year of looking at contaminants in our drinking water that we either don't know about or can't fix.

Mr. LEVIN. Dr. Bole.

Dr. BOLE. Thank you for the question. And thank you for reminding us that, when we talk about emissions, we are talking about those criteria air pollutants, and that is what I mean when I talk about immediate co-benefits of making this transition, but about health impacts of flooding and issues and coastal regions with sea level rise, Gina mentioned some of them. And I will just add that, in addition to some of the drinking water contamination that she mentioned, we may also see that vector-borne illnesses, especially when there are vectors like mosquitoes that thrive in standing water, especially if it is warm, that can be an issue in some of our coastal communities, as well as other water-borne illnesses that are not vector borne can really start to plague communities that never saw some of those illnesses before that were not previously endemic regions for those illnesses and that, therefore, may not be really equipped from a public health perspective to handle it. So I think that is part of what we need to think about when we talk about climate smart planning for disasters in those coastal regions. We are talking about infectious diseases, about drinking water, and then, of course, also displacement, property damage and some of the catastrophic events you described.

Mr. LEVIN. I am out of time. I greatly appreciate—Mr. Rodriguez, you had one last comment.

Mr. RODRIGUEZ. Just one quick point. I know Orange County no longer is a big agricultural county like it used to be, but what is happening in those counties that still provide agricultural products like Ventura County and Monterey County, Salinas Valley, the salad bowl of America, we have been suffering a lot as a result of water intrusion and so forth. And in Monterey County, saltwater intrusion there is eroding the valley. That is one of the prime counties in America for providing fruits and vegetables to Americans and to other people across the world. And so we are in danger of really losing these agricultural communities because of sea level rise and water intrusions and so forth.

And thank you very much.

Mr. LEVIN. Thank you for that. Thank you for reminding us all how many great things come from California.

And I will yield back.

Mr. CARTER. Did he name both of them?

Mr. LEVIN. There is a lot more, buddy. There is a lot more.

Ms. CASTOR. All right. Mr. Carter, you are recognized for 5 minutes.

Mr. CARTER. Thank you very much, Madam Chair, and thank you for holding this hearing.

Thank all of you for being here. We appreciate it very much.

I have the honor and privilege of representing the First Congressional District of Georgia, which includes the entire coast of Georgia and a lot of rural area in south Georgia. As we say quite often, there are two Georgias; there is Atlanta, and then there is everywhere else. And I represent everywhere else in rural Georgia. And I want to talk about—but before I do talk about this, let me also mention—and this may come as news to my colleagues up here—that Georgia is the number one forestry State in the Nation. And I just want to make sure that everybody understood that and knew that, and we are.

But, nevertheless, I want to talk about rural America because I think it is extremely important. Mr. Rodriguez, would you agree that the rural areas in our country have unique challenges when it comes to creating solutions to climate change, and it is essential that our rural areas have a voice in this process?

Mr. RODRIGUEZ. Well, definitely. I mean, as a result of the climate change now, we have seen in your State in Georgia as well as many other States across the country, the increase in temperatures, especially during the harvest season times. And just recently, within the last 2 years, we had a farm worker die in your State as a result of exposure to heat illness. And the temperatures have risen.

When we don't provide shade or provide drinking water or supervisors and foremen and ranch managers are not adequately trained on how to deal with these particular situations, we have a really severe impact in terms of what is taking place with agriculture and agricultural workers in those particular communities. So, yes, it is definitely having an impact in rural areas, in your State as well as many other States across the country.

Mr. CARTER. Let me ask you—and I will ask you, and then I will ask Dr. Bole the same question—but should we be focusing on making sure that our rural hospitals are resilient and that they—especially to severe weather events because we have had so many rural hospitals, particularly in Georgia, that have closed and this creates a real challenge to our area?

So is it important that we concentrate on that as legislators, Mr. Rodriguez, on our rural hospitals?

Mr. RODRIGUEZ. You know, definitely we have to be—ensure that the doctors, that the medical facilities, that they are also very knowledgeable about heat exposure and the impact that it has on workers, on the lives, and what that can do to folks. And I know oftentimes we have not found that to be the case in particular areas and so forth. Now I think people are becoming much more—they are recognizing what this heat exposure does to folks, and they are dealing with it in a much more meaningful way in terms of avoiding further deaths of farm workers and folks within rural communities.

Mr. CARTER. Okay. Thank you.

Dr. Bole, what would you say in regards to our rural hospitals? How important is it that we make them resilient and that they are trained to deal with these severe weather events and make sure that we have these safety net hospitals?

Dr. BOLE. Thank you. Thank you for the question. We certainly have rural hospitals in my region, though I practice in Cleveland,

northeast Ohio is home to many rural hospitals and also many communities who are challenged for access to care in rural regions. So, to answer your question, I do think it is important that rural hospitals be part of the solution when it comes to resilience to some of these extreme weather events. When you talk about access, your comment about those hospitals closing and some of those—impaired access for some of those communities, I think that gets into a much broader issue that may be out of scope for this particular group related to healthcare reimbursement and some of the financial pressures on those hospitals that are causing some of them to close. But from the standpoint of resilience and preparedness and training, as Mr. Rodriguez said, I concur that those points of access are important.

Mr. CARTER. Just a general question, even to you, Ms. McCarthy, do you think that we are directing too much of our resources to the urban areas and not enough to the rural areas?

Ms. MCCARTHY. I don't know if I have a good breakdown of what that allocation might be, but I totally agree with you that attention in rural communities is extremely important, and I know this committee has been looking at some of those issues, in particular, with hospitals and the fact that we have only one program—and that is at the CDC—that really helps both States and local communities to address hospitals and ensure that they are resilient.

And so I would totally agree with you that we have to look at those issues, and I have not seen a great commitment on the part of this administration to do that, and it should be fully funded. There should be activity looking at where access is available, not just where the hospitals are resilient. There is something called a hospital stress test that I know folks have been talking about which is great. It is an opportunity to look at what are we missing, what are we not thinking about, how do we plan for those extreme weather events, how do we have our supplies ready, and we have seen some of that work highlighted in terms of its importance with the challenges that Puerto Rico has faced, which actually shut down medical equipment that impacted the entire country. And so I agree with you. This is a big deal issue, and it should be resourced effectively.

Mr. CARTER. Great. Thank you very much all of you.

And I yield back.

Ms. CASTOR. Mr. Huffman, you are recognized for 5 minutes.

Mr. HUFFMAN. Thank you, Madam Chair, and thanks to the witnesses for a great conversation.

I want to continue a few of the threads that my friend, Mr. Graves, started in his comments.

And, Director McCarthy, you are pretty familiar with the Paris accord?

Ms. MCCARTHY. Yes.

Mr. HUFFMAN. So, lest we just accept this notion that it allows a net increase in emissions, I want to drill in a little deeper because my understanding is that, while the United States is committed to a reduction, developing countries, although they will continue to increase emissions for a period of time, it is a much lower increase and eventually will cap and decline as well.

So I wanted to see if you agreed with the fairness of Mr. Graves' characterization that the Paris accord calls for a net increase in emissions relative to the status quo?

Ms. MCCARTHY. I think it is clear that we are looking for every country to contribute. And China's commitment, and one of the major parts of the commitment, was to cap its emissions because it has numerous communities that it's trying to build out of poverty, and they are looking at strategies now to do that in a way that is reliant more on clean energy than it is on coal. And so there is actually an accelerated process in China to do even better than what they committed to about capping their emissions.

And so one of the challenging things we have to look at that wasn't mentioned is that the U.S. has been on a trajectory up until 2018 of lowering its carbon emissions, and now we are going—

Mr. HUFFMAN. We are sliding back.

Ms. MCCARTHY. And so, at best, we can see maybe a 4-percent reduction in the U.S. in 2050 when we have to be net zero.

Mr. HUFFMAN. The bottom line, even China, under the Paris accord, lower emissions than without the Paris accord, correct?

Ms. MCCARTHY. But it certainly doesn't help to have the U.S., which is number two now, actually increasing our emissions considerably and changing that trajectory that we have been all hoping that would be on a much steeper downward trend.

Mr. GRAVES. Will the gentleman yield?

Mr. HUFFMAN. Well, if I have time at the end, I will. But couldn't agree more. Now, on the notion that we only need to be concerned about the emissions from fossil fuel. First of all, with respect to these—we hear this a lot under the term “innovation” from some of our colleagues across the aisle. As far as I know, every carbon capture project out there, including the one in Houston that was referenced, is simply taking the carbon captured from that particular emission source and then putting it back in the ground to enhance oil recovery. In other words, yes, you could say it is a net zero natural gas plant in Houston; however, that carbon is being used to develop more oil that is in turn burned without capture in various ways. So that is not really net zero. Do I have anything wrong with those facts?

Mr. GRAVES. Yes.

Mr. HUFFMAN. My time for now, and I will see if I can get to Mr. Graves.

Ms. MCCARTHY. Just very quickly. I know there is a lot of new creative thinking about CCS, but the thing we are not looking at is the fact that you extract the fossil fuels itself is a decision point of emitting significant amounts of methane volatile organic compounds. These are challenges for communities both from a health perspective and a climate perspective.

Mr. HUFFMAN. So I will come back to that because it is more than just the burning that causes the issues, but when we capture carbon only to use it to develop more oil that is burned without capture, that is not exactly a closed loop—

Ms. MCCARTHY. As far as I know, that is the only financially viable way that anyone has come up with. So it seems like you are robbing Peter to pay Paul.

Mr. HUFFMAN. Yes. I agree. Now, also, I was just in Mr. Graves' beautiful state of Louisiana, and he showed me some amazing places. From the air, we got to see areas that were hit very hard by the BP oil spill. And so I am immediately reminded when we talk about emissions being the only aspect of the public health problem with fossil fuels, well, there is also that other type of catastrophe, the catastrophic oil spills, which did hit, I think, a lot of struggling, low-income disadvantaged communities very hard.

Mr. Graves lived through it. He showed me some of the continuing legacy effects of that. And we also, you know, seems like, every few weeks, there is an explosion in a refinery. You have got entire communities that are located near these fossil fuel facilities that live in fear of things going wrong. I have never heard of a catastrophic wind or solar spill or a catastrophic wind or solar refinery explosion. So let's just push back for a minute on the notion that it is only the emissions that cause the public health concerns. You are welcome to comment on that as well.

Ms. MCCARTHY. Well, there is huge cost associated with fossil fuel extraction and use and in products. So let's not forget that plastics aren't going away in our ocean because they are fossil fuel based. Let's not forget about the toxics that are in our blood as a result of fossil fuels products being in the products that we buy and consume. So there is a lot of challenges here that we need to face, but the bright spot is that fossil fuel energy is simply less attractive and more expensive in many ways directly across the country now. So we should celebrate that.

Mr. HUFFMAN. And I am sorry, Mr. Graves, that I didn't have time for a colloquy. I always enjoy them. Maybe the chair will find some time for us to do that.

Ms. CASTOR. Thank you very much.

Mr. Palmer, you are recognized for 5 minutes.

Mr. PALMER. Thank you, Madam Chair.

I will be happy to yield 30 seconds to my colleague, Mr. Graves.

Mr. GRAVES. See how that works. Thank you. I want to thank the gentleman from Alabama.

A few quick points. Number one, China being considered a developing nation is completely laughable and any agreement that includes that. They are spending not millions but trillions of dollars in military activities and investment in other countries. Absurd that anyone pretends to say, "Oh, let them go. They are a developing nation." Totally inappropriate. I understand it is not your fault, but inappropriate.

Number two, other impacts of the oil spill. Look, this is the point I make all the time: When we don't produce energy domestically facts, facts have shown what happens is we import it from other countries, which means you have a less—a higher chance of spilling it. A higher chance of spilling it by importing it from other countries. Statistics are crystal clear—

Mr. HUFFMAN. Will the gentleman yield for just a clarification?

Mr. GRAVES. I would love to—

Mr. HUFFMAN. Does that mean we only have two choices—

Mr. GRAVES. Renewables are not without impacts. Madam Chair? Madam Chair, I did not yield.

Renewables are not without impacts. They are not without impacts. It has been proven. They have environmental impacts as well. You look at the manufacturing that they have stolen from us in intellectual property. You look at the child labor that is happening in China. These things are unbelievable in some cases, and we cannot just say, "Oh, look, it is wind; it is okay." The bird blender thing and other impacts as well.

Lastly, yes, we did have an increase after a 15-year decrease under Republican and Democratic administrations in emissions. We cannot forget—none of us can—Republicans or Democrats, we are the global leader in emissions reduction, period. Stop sitting there saying we have got to take a 180. What we need to be doing is looking and seeing how we have been the global leader and build upon those successes. And, of course, that does include renewables. It has got to. But we have got to be thoughtful and make sure that we are making fact-based decisions and not out there chasing unicorns.

Now, last year, yes, they went up. But you know what else happened? We lifted people up out of poverty. We have the lowest unemployment rate that we have had in decades. That is exactly right. That is exactly right. I remember seeing you sit down. Sorry we put that super glue in your chair, but, Madam Chairman, this is a huge deal. We lifted people out of poverty, and for 2020, we are going to be back to a net reduction. I want to thank my friend from Alabama.

Mr. PALMER. The magic 30 seconds. I thank the gentleman.

I want to make a few points here that you talk about asthma rates, and the fact is, is that we don't know what causes asthma. The National Institute of Environmental Health, CDC, makes clear we don't know what causes asthma. We know things that exacerbate it, and a lot of that is related to emissions, but the interesting thing is, since 1970s, since we have passed the Clean Air Act, the economy has almost tripled. It has grown by 295 percent, yet emissions have declined by 74 percent. And that includes nitrogen dioxide, which is related to traffic congestion, which is a factor in exacerbating asthma. And so you come in here and you talk about these things that—as though climate change or CO₂ or something like that is causing asthma. That is a misrepresentation.

In terms of Massachusetts, you know, your government in the State of Massachusetts will not buy gas that is produced in the Marcellus Shale Formation from Pennsylvania. You have got some of the highest household energy costs in the country. You are literally—and these are stats from Nationwide—well, 24 percent of the families are going without food for at least 1 day because they are having to choose between buying food or paying their household energy costs, you know, keeping them from freezing to death or burning up in the summertime; 37 percent went without medical or dental care; 34 percent did not fill a prescription or took less than a full dose; additionally 23 percent kept their homes at a temperature that was unhealthy or unsafe. And the interesting thing about Massachusetts—and you come in here, and you want to talk to us about emissions—you are buying gas from Russia, which is at best an adversary, at worst an enemy, and it is 41 to 47 percent emissions are dirtier than the natural gas you could buy right

down the road from Pennsylvania. That makes no sense whatsoever.

My last point in my last few seconds is when you talk about extreme weather events, would you consider a 200-year drought in California to be an extreme weather event? Anybody?

Mr. RODRIGUEZ. The drought?

Mr. PALMER. Yeah, 200-year drought.

Mr. RODRIGUEZ. It is having a very big impact on agriculture.

Mr. PALMER. Now here is the thing. The climate is changing. The geologic record shows the climate is changing. And if you look at the history of drought in California in the last thousand years around the 9th century, you had a drought that began in the middle of the 9th century lasted 200 years. Then you had a 50-year wet period, then you had another drought that lasted 180 years. We are not preparing for the climate change that is going to occur, and we are going to pay an enormous price, the people of this country are going to pay an enormous price if we keep chasing some of these issues that my colleagues are so focused on and we don't prepare for what is going to occur. And just study the science, study the geology, and you will figure that out.

I yield back.

Ms. CASTOR. I am going to give the—there was a lot there, Mr. Palmer. I am going to give the witnesses just a brief opportunity to answer quickly.

Dr. BOLE. Thank you. Thank you for the comments and for the opportunity. I just would like to briefly clarify the points about asthma. Number one, there is a lot of information about what exacerbates childhood asthma, and I want to clarify that I did not state that CO2 causes asthma. That is not true. That is not what I stated. But we do know a lot about what exacerbates asthma and that there are air pollutants that exacerbate asthma that result from burning fossil fuels, in addition—both from transportation and from power plants, but in addition, that rising surface temperatures—so rising surface temperatures in the context of climate change are resulting in alterations in air quality itself when it comes to increased surface ozone and increased aeroallergens that do have an impact on pediatric asthma.

I also want to point out that asthma is only one common pediatric condition. I used that as an example in my remarks, but just want to clarify that those increased surface temperatures are causing complex changes, as I mentioned some examples earlier, that are also resulting in some pretty important pediatric health issues. So I think we talk a lot about asthma as we should because it is a very common pediatric health condition, but there are a lot of other conditions that I mention in my remarks, and I just want to clarify sort of what is causing what.

And I don't know if, Ms. McCarthy, you want to clarify the second point.

Ms. MCCARTHY. Yes. I just wanted to talk a little bit about Massachusetts, which I know a little bit about. I just wanted to point out I don't know where the data that you articulated comes from, but I would love to see it because, in my experience, Massachusetts has done a wonderful job and, in fact, throughout the region to take a look at how we can rely more heavily on renewable fuels

and how that can help us keep energy demand down and how we can have that build a healthier future for ourselves.

Now, the regional greenhouse gas initiative is a program in point. That started in 2009, and since then, it has created 45,000 job years of work. It has grown the region's economy by \$4.3 billion. It has provided public health benefits that are worth \$5.7 billion, and energy bill savings of \$1 billion. It has not caused individuals to have less money in their pockets; it has provided more money in their pockets. But I totally agree with you that no child should go hungry. We should figure out a way to resolve those issues, but I don't think it is the decision on energy in New England or Massachusetts that has caused that to happen.

Ms. CASTOR. Thank you very much.

Now I am going to ask to take my 5 minutes. This has been an interesting discussion.

Ms. McCarthy, you stated that climate change is the most significant health challenge of our lifetimes, but I see it as an enormous opportunity when it comes to the public health. We are on the cusp of an exciting transition, for example, in school buses that children will be riding electric, clean school buses and the air that they breathe will be cleaner.

Dr. Bole, you also mentioned the impact of asthma, as Ms. McCarthy did, if you live next to a highway. Think about the transition in the energy sector as the vehicles we drive become cleaner and greener and the air is improved for families across this country, energy efficiency that will put money back into the pockets of families.

Ms. McCarthy, what else do you see on the horizon as an opportunity for America and for folks across the globe to harness the clean energy transition?

Ms. MCCARTHY. Well, I am really excited. I realize that we spend a lot of time talking about Federal action, and I think this committee is going to be developing some policy recommendations that will be great to see. But I am excited about what is going on at the State and Federal level—at the State and local levels. I am excited about renewable energy. I am excited about ways in which we can invest in different types of transportation, like work that is being advanced through the transportation and climate initiative. I mean, these are multi-state efforts where we are binding together and realizing that it is the future and the health of our kids and that we can have both. I am with you that it is an opportunity. We have solutions available to us. They can be as simple as addressing heat stress, not just for our farm workers, but in our inner cities for the elderly. We can do more, and we must.

Ms. CASTOR. And, Mr. Rodriguez, God bless the farm workers who provide the food that families enjoy every day, and thank you for your work in California working with the agriculture industry to make sure that farm workers have basic protections, that they are not working outside without water and in the highest of heat indexes.

So you have—they have adopted the standards in California, was there any impact on agricultural productivity or the economy there due to the adoption of heat standards in California?

Mr. RODRIGUEZ. No. In fact, we have seen the industry continue to prosper, and we are all very happy about that. And then we have seen some really innovative changes that some of the agricultural employers have made. I know when we first passed the regulations, there was tarps that were put out in the fields where workers could go for shade, and there was aluminum chairs set out. Now when you travel up and down Highway 5 and Highway 99 and see the agricultural areas there, you will oftentimes have trailers that are pulled out there with roofs on tops, tables, and benches there so that the workers can go there for not only to take a break but also go eat their lunch there. And it is a huge change, and that was primarily done by the industry itself.

So we are very excited about what has already taken place, and we hope to see a lot more.

Ms. CASTOR. Well, I would hope that farm workers and folks who work outside all across this country could enjoy the same protections, and I look forward to this select committee's recommendations to Congress to do just that.

Mr. RODRIGUEZ. Thank you very much on that.

Ms. CASTOR. I would like to end, Dr. Bole, with you because our work here at the select committee has really highlighted our moral obligation that we have to our children and future generations to make sure that they grow up in a livable world. When the select committee makes its recommendations to the Congress, it is going to have to be built upon a foundation of environmental justice recognizing that our working class communities and communities of color have really bared the burden over the years of carbon pollution and fossil fuel development. Will you reference, when it comes to kids, this vulnerable group that we want to ensure that they have every opportunity to succeed in life, why hasn't it been, in your opinion, that it has been children of color, African American children, Latino children, children from working class communities that have borne the brunt of pollution? And what should we have in the front of our minds as we develop these recommendations for the Congress?

Dr. BOLE. Thank you for the question. So a couple comments. With respect to those communities of color, you know, when we have sort of a not-in-my-backyard kind of a mindset around some of these sources of pollution and some of the end results of pollution or where do we put our highways or what kinds of housing ends up near those highways, traditionally, politically marginalized or less powerful groups oftentimes are the recipient of those injustices. And so the first thing I would say when it comes to solutions is that members of those communities, we are seeing young people and leaders from historically marginalized communities just really coming out as strong, well-informed energetic leaders advocating for their own communities. So I think having a seat at the table for historically marginalized communities, their leaders, and their youth is critically important, and I just want to also circle back quickly to your opening comment about this being an opportunity.

I absolutely agree, and I would really like to underscore that climate solutions are child health solutions. They have an impact on birth outcomes. If we are serious about infant mortality, we need to get serious about climate action. They have an impact on school

readiness and neural development. We talk about school readiness all the time. If we want kids whose brains are growing in a healthy way and are ready for school, we got to be serious about clean air, climate action, and sustainable communities. Obesity, asthma, mental health issues, a lot of the thorniest chronic conditions that we pediatricians are dealing with when we see our patients, we know that climate solutions are truly upstream preventive solutions that can make a real difference on some of these intractable problems. So I see it as an opportunity as well, especially for our most vulnerable communities. So I thank you for framing it that way.

Ms. CASTOR. Well, thank you all. Your testimony has been very helpful.

And, without objection, all members will have 10 business days within which to submit additional written questions for all of our witnesses.

I ask you all to respond as quickly as you possibly can.

And at this time, I will recognize the ranking member for a UC request.

Mr. GRAVES. Thank you, Madam Chair. Madam Chair, the one thing I said was inaccurate, just one, and I want to clarify that I said that emissions went up in 2019; they actually went up in 2018.

I want to ask unanimous consent that we submit for the record a Rhodium Group report that shows that emissions actually decreased in 2019 by 2.1 percent and that we had the greatest reduction in emissions in the energy sector ever in 2019, which was a 10-percent reduction.

The report also shows that we have actually exceeded the emissions targets set by the Clean Power Plan, which was 32 percent by 2030. We have actually hit 34 percent as of now, which is remarkable.

Secondly, I want to submit a report indicating the price of electricity per State showing that those States that are more aggressive on climate have higher energy costs having a disproportionate impact on the poor.

And, thirdly, and most importantly, Madam Chair, I want to submit a report showing that it is actually the State of Maine that has the highest percentage of forestry in the State. Georgia is down near number nine, which is somewhere in proximity of where their football team ended in the college football rankings.

I yield back.

Ms. CASTOR. Well, we, unfortunately, did not get copies of those reports. If you—so I am going to reserve ruling on that.

And, in turn, since we have heard a lot about emissions today, I would like to point out that last week DOE's energy information outlook projected the current policies will mean that U.S. energy-related CO₂ emissions, unfortunately, are poised to grow in the future. To get to net zero carbon pollution by at least 2050, as we have heard from scientists at our second hearing and as made clear in the National Climate Assessment and in the IPCC report, we need bold, Federal policy action on climate solutions, and that is what this committee intends to do.

So thank you. We will reserve ruling on these UC requests, but I imagine we will take it up at our next hearing.

Thank you to the witnesses today.

We are adjourned.

[Whereupon, at 10:28 a.m., the committee was adjourned.]

Submissions for the Record

Representative Garret Graves
Select Committee on the Climate Crisis

February 5, 2020

ATTACHMENT: Preliminary US Emissions Estimates for 2019. Houser, T., & Pitt, H. 2020, January 7.

The report is retained in the committee files and available at:
<https://rhg.com/research/preliminary-us-emissions-2019/>

ATTACHMENT: State Electricity Profiles. U.S. Energy Information Administration. 2019, December 31.

The data is retained in the committee files and available at:
<https://www.eia.gov/electricity/state/>

United States House of Representatives
Select Committee on the Climate Crisis

Hearing on February 5, 2020

**“Creating a Climate Resilient America:
 Overcoming the Health Risks of the Climate Crisis”**

Questions for the Record

The Honorable Gina McCarthy
President and Chief Executive Officer
Natural Resources Defense Council

THE HONORABLE KATHY CASTOR

1. The impact of extreme heat on a person’s health is relatively straight forward to understand. However, recent research has also found that these extreme weather events like extreme heat can impair a person’s behavior and cognitive development. Can you explain more about this research?

Extreme heat can exacerbate schizophrenia, suicidality, and other serious conditions among people with existing mental health illnesses, and affect cognitive abilities and sense of well-being among those without.^{1 2 3 4 5 6} The stress of unhealthy

¹Yoonhee Kim et al., “Suicide and Ambient Temperature: A Multi-Country Multi-City Study,” *Environmental Health Perspectives* 127, no. 11 (November 2019): 117007, <https://doi.org/10.1289/EHP4898>.

²Jamie T. Mullins and Corey White, “Temperature and Mental Health: Evidence from the Spectrum of Mental Health Outcomes,” *Journal of Health Economics* 68 (December 2019): 102240, <https://doi.org/10.1016/j.jhealeco.2019.102240>.

³Nai-Tzu Chen, Po-Hsiu Lin, and Yue-Liang Leon Guo, “Long-Term Exposure to High Temperature Associated with the Incidence of Major Depressive Disorder,” *Science of The Total Environment* 659 (April 2019): 1016–1020, <https://doi.org/10.1016/j.scitotenv.2018.12.434>.

⁴Rupa Basu et al., “Examining the Association Between Apparent Temperature and Mental Health-Related Emergency Room Visits in California,” *American Journal of Epidemiology* 187, no. 4 (April 1, 2018): 726–735, <https://doi.org/10.1093/aje/kwx295>.

⁵Clemens Noelke et al., “Increasing Ambient Temperature Reduces Emotional Well-Being,” *Environmental Research* 151 (November 2016): 124–129, <https://doi.org/10.1016/j.envres.2016.06.045>.

⁶Jose Guillermo Cedeño Laurent et al., “Reduced Cognitive Function during a Heat Wave among Residents of Non-Air-Conditioned Buildings: An Observational Study of Young Adults in the Summer of 2016,” ed. Jonathan Alan Patz, *PLOS Medicine* 15, no. 7 (July 10, 2018): e1002605, <https://doi.org/10.1371/journal.pmed.1002605>.

heat and other weather extremes has also been linked to impaired learning and behavior disorders in children.⁷

The mechanisms by which extreme heat harms mental health and cognitive function are not well understood. One possibility is that high temperatures affect how different parts of the brain “talk” to each other.⁸ For example, exposure to extreme heat may affect serotonin function, leading to increases in violence, impulsive behavior, or aggression.^{9 10} Another possibility is that hotter nighttime temperatures reduce sleep quality and quantity.^{11 12}

The disturbing evidence gathered so far on the link between heat and brain health points to the need for more research in this area. Further, climate and health adaptation plans should have a greater focus on mental health and cognitive functioning.

2. In your testimony, you cite figures that could compromise our military’s readiness posture. From 2014 to 2018, the rate of heat stroke among active duty members increased 73 percent and the rate of heat exhaustion increased nearly 53 percent. What are the national security implications if these figures increase?

The Department of Defense (DOD) has reported that extreme heat is already affecting troop readiness.¹³ This is particularly true in the Middle East and the U.S. Southwest and Southeast, where extreme heat has interfered with training and testing operations.¹⁴

Extreme heat and drought can also damage roads and infrastructure at military bases, reduce the effectiveness of computer servers, cause water shortages, increase energy use, and increase social and political instability in some regions.^{15 16}

Thanks to the U.S. military’s aggressive approach to identifying and treating heat-related illnesses, the death rate from extreme heat among service members has been relatively low in recent years.¹⁷ However, the Government Accountability Office found in June 2019 that “DOD installations have not consistently assessed risks from extreme weather and climate change effects.”¹⁸

The DOD needs to more ambitiously plan for and implement measures to both protect the health of service members and maintain our national security in the face of climate disruption.

3. Our health care sector is of the utmost importance to prepare for and respond to disasters. The health sector must become climate resilient. What

⁷ Frederica P Perera, “Multiple Threats to Child Health from Fossil Fuel Combustion: Impacts of Air Pollution and Climate Change,” *Environmental Health Perspectives* 125, no. 2 (2017): 141–148.

⁸ Mare Lohmus, “Possible Biological Mechanisms Linking Mental Health and Heat—A Conceptual Review,” *International Journal of Environmental Research and Public Health* 15, no. 7 (July 18, 2018): 1515, <https://doi.org/10.3390/ijerph15071515>.

⁹ Yoonhee Kim et al., “Suicide and Ambient Temperature: A Multi-Country Multi-City Study,” *Environmental Health Perspectives* 127, no. 11 (November 2019): 117007, <https://doi.org/10.1289/EHP4898>.

¹⁰ Ryan Harp and Kristopher Karnauskas, “Global Warming to Increase Violent Crime in the United States,” *Environmental Research Letters*, January 14, 2020, <https://doi.org/10.1088/1748-9326/ab6b37>.

¹¹ Nick Obradovich et al., “Nighttime Temperature and Human Sleep Loss in a Changing Climate,” *Science Advances* 3, no. 5 (May 2017): e1601555, <https://doi.org/10.1126/sciadv.1601555>.

¹² Mullins, Jamie T., and Corey White. 2019. “Temperature and Mental Health: Evidence from the Spectrum of Mental Health Outcomes,” *Journal of Health Economics* 68 (December): 102240, <https://doi.org/10.1016/j.jhealeco.2019.102240>.

¹³ Office of the Under Secretary of Defense for Acquisition and Sustainment, “Report on Effects of a Changing Climate to the Department of Defense” (Department of Defense, January 2019), <https://media.defense.gov/2019/Jan/29/2002084200/-1/-1/1/CLIMATE-CHANGE-REPORT-2019.PDF>.

¹⁴ Government Accountability Office, “Climate Change Adaptation: DOD Needs to Better Incorporate Adaptation into Planning and Collaboration at Overseas Installations,” November 2017, <https://www.gao.gov/assets/690/688323.pdf>.

¹⁵ *Ibid.*

¹⁶ Kate A. Guy et al., “A Security Threat Assessment of Global Climate Change: How Likely Warming Scenarios Indicate a Catastrophic Security Future” (Security, Military, and Intelligence Panel on Climate Change, The Center for Climate and Security, February 2020), https://climateandsecurity.files.wordpress.com/2020/02/a-security-threat-assessment-of-global-climate-change_nsmip_2020_2.pdf.

¹⁷ Benjamin P. Donham et al., “Low Incidence of Death and Renal Failure in United States Military Service Members Hospitalized with Exertional Heat Stroke: A Retrospective Cohort Study,” *Military Medicine* 185, no. Supplement—1 (January 7, 2020): 362–367, <https://doi.org/10.1093/milmed/usz214>.

¹⁸ Government Accountability Office, “Climate Resilience: DOD Needs to Assess Risk and Provide Guidance on Use of Climate Projections in Installation Master Plans and Facilities Designs,” June 2019, <https://www.gao.gov/products/gao-19-453>.

are some actions that Congress can take to make this critical health infrastructure climate-resilient?

Climate change imposes huge cost burdens on the U.S. healthcare system by increasing illnesses and deaths, inflicting major damage on hospitals and other healthcare facilities, and creating extended disruptions in operations.^{19 20} For example, the NYU Langone Medical Center suffered nearly \$1 billion in damages after Hurricane Sandy in 2012, and was unable to provide emergency room services for a year and a half after the storm.²¹

Despite progress in the wake of Hurricane Katrina and other major events, a recent review by Johns Hopkins' Bloomberg School of Public Health found significant room for improvement in the healthcare sector's resilience to large-scale natural disasters.²² Improvement is hampered by the current piecemeal approach to federal regulation of hospitals and other facilities, recent declines in funding for emergency preparedness in hospitals, and the complicated interdependence between privately-owned facilities and public infrastructure such as roads and electric utilities.

Congress should:

- Increase funding for the Hospital Preparedness Program, which fell from \$500 million in 2004 to \$254.5 million in 2019.²³
- Ensure healthcare practitioners have ready access to reliable climate risk data and the technical support they need to make decisions. For instance, nearly a third of the 16 Harris County hospitals that flooded during Hurricane Harvey were outside the flood hazard areas designated by the Federal Emergency Management Administration, and half were outside the hurricane's projected inundation boundary.²⁴
- Condition federal funding for hospitals and other healthcare facilities on climate vulnerability assessments and adaptation plans, using documented application of the Sustainable and Climate Resilient Health Care Facilities Toolkit as a minimum requirement.²⁵ These assessments and plans should account for both acute hazards such as wildfires, and more gradual climate hazards such as sea level rise and increases in average temperature.
- Invest in modernization of our electric grid and transportation and drinking water systems, which are all vital to the overall climate resilience of hospitals.²⁶

¹⁹ Vijay S. Limaye et al., "Estimating the Health-Related Costs of 10 Climate-Sensitive U.S. Events During 2012," *GeoHealth* 3, no. 9 (September 2019): 245-265, <https://doi.org/10.1029/2019GH000202>.

²⁰ Health Care Without Harm, "Safe Haven in the Storm: Protecting Lives and Margins with Climate-Smart Health Care," 2018, <https://noharm-uscanada.org/safehaven>.

²¹ Nate Seldenrich, "Safe from the Storm: Creating Climate-Resilient Health Care Facilities," *Environmental Health Perspectives* 126, no. 10 (October 2018): 102001, <https://doi.org/10.1289/EHP3810>.

²² Eric Toner et al., *A Framework for Healthcare Disaster Resilience: A View to the Future*, Johns Hopkins Bloomberg School of Public Health Center for Health Security, 2018, http://www.centerforhealthsecurity.org/our-work/pubs_archive/pubs-pdfs/2018/180222-framework-healthcare-disaster-resilience.pdf.

²³ Steven Ross Johnson, "Federal Hospital Preparedness Funding Weaker as Requirements Tighten," *Modern Healthcare*, August 20, 2019, www.modernhealthcare.com/government/federal-hospital-preparedness-funding-weaker-requirements-tighten.

²⁴ Emmanuelle Hines and Colleen E. Reid, "Hurricane Harvey Hospital Flood Impacts: Accuracy of Federal Emergency Management Agency Flood Hazard Areas in Harris County, Texas," *American Journal of Public Health*, February 20, 2020, e1-6, <https://doi.org/10.2105/AJPH.2019.305520>.

²⁵ U.S. Climate Resilience Toolkit, "Building Health Care Sector Resilience," modified November 22, 2016, <https://toolkit.climate.gov/topics/human-health/building-climate-resilience-health-sector>.

²⁶ NRDC, "Invest in 21st Century Infrastructure," 2020, <https://www.nrdc.org/issues/invest-21st-century-infrastructure>.

Questions for the Record

Aparna Bole, MD, FAAP
Chair, AAP Council on Environmental Health
American Academy of Pediatrics

THE HONORABLE KATHY CASTOR

1. Could you please elaborate on how climate change contributes to the exacerbation of asthma, including both the direct contributions of fossil fuel-related emissions as well as the changing climate itself?

Climate change contributes to asthma exacerbation by multiple mechanisms. Higher concentrations of carbon dioxide and warmer temperatures lead to increased pollen counts, longer allergy seasons, and elevated ground-level ozone that makes it harder to breathe, especially for those with underlying lung disease.ⁱ In some areas of the United States, increased temperatures and changing precipitation patterns are contributing to longer and more intense wildfire seasons, which produces harmful particulate pollution that has been associated with increased severity of asthma exacerbations for children.ⁱⁱ All of these factors exacerbate respiratory disease and asthma, leading to higher rates of asthma exacerbations.^{iii iv} In general, children have increased exposure to many air pollutants compared with adults because of higher minute ventilation and relative time spent outdoors and thus are at increased risk of poor outcomes related to air pollution.^{v vi} In addition, because children's lungs are still developing, they are at increased risk of long-term harm from exposure to air pollution.

Fossil fuel combustion also directly contributes to worsening air quality through the release of harmful pollutants such as nitrogen dioxide, sulfur dioxide, ozone, and particulate matter, which have been linked to premature death, asthma exacerbations, and other respiratory symptoms that are most likely to affect children. In addition to contributing to climate change, these emissions have a direct influence on child health and have been associated with increased health care utilization and missed school days.^{vii} The interaction of emissions from fossil fuel combustion and climate change-related temperature elevations poses an increased risk for anyone with underlying lung disease such as asthma. This presents difficult decisions for children, families, and physicians who must balance the importance of physical activity such as outdoor sports practice with the increasing risk of dangerous asthma exacerbations on high ozone days.

2. Can you explain the ways in which reducing carbon pollution also generates additional health benefits through promoting reductions in other harmful pollutants impacting children?

While climate change disproportionately impacts child health, reducing carbon pollution also presents an enormous opportunity to improve child health by maximizing the co-benefits of carbon pollution reduction. Reducing emissions of hazardous traditional air pollutants such as particulate matter, sulfur oxides, and air toxics along with carbon dioxide can yield greater health outcomes for children. In addition to asthma exacerbations, child exposure to hazardous air pollutants can cause neurologic deficits, respiratory tract illness, and decreased lung function,^{viii ix} leading to downstream effects including increased school absences, emergency department visits, and hospitalizations.^{x xi xii} Studies have also found associations between ambient air pollution and postneonatal infant mortality,^{xiii xiv} low birth weight,^{xv xvi xvii xviii} and preterm birth.^{xix xx xxi xxii} Reducing these pollutants under the Clean Power Plan would have prevented up to 6,600 premature deaths. In addition, it would have resulted in 3,700 fewer cases of child bronchitis, up to 150,000 fewer asthma exacerbations in children, and 180,000 fewer missed school days in the year 2030.^{xxiii} Reducing fossil fuel combustion can improve children's health and development over their entire life course.

Future decarbonization efforts should prioritize this potential for drastic improvements in child health outcomes through leveraged reductions of multiple pollutants within efforts to reduce greenhouse gas emissions. It is crucial to transition from clean, renewable energy sources such as wind, solar, and hydropower while improving energy affordability for consumers. Utility insecurity is a patient health issue that can force families to make impossible decisions between heating their house, putting food on the table, and accessing health care. The families and communities most impacted by utility insecurity are also likely to bear a disproportionate burden of the health harms of fossil fuel combustion. The good news is, we know that we can effectively address climate change while also addressing utility insecurity. As the U.S. makes the necessary transition from energy sources that contribute to climate change and poor health outcomes, policymakers should consider ways to in-

crease access to affordable energy to maximize the health benefits of reducing carbon pollution. Addressing utility insecurity should include improving home energy efficiency and supporting local renewable energy generation to support community health and sustainable energy security. Beyond the energy sector, reducing the carbon footprint of other sectors of the U.S. economy can yield important child health co-benefits, such as increased active transportation, healthier plant-based diets, and access to green spaces. Urban planning efforts that reduce sources of air pollution and create mitigation strategies like green spaces also have the co-benefit of community design that ensures safe places to walk and play, greater social cohesion, and the mental and physical health benefits of access to nature. These policies bring important child health co-benefits and present a tremendous opportunity to improve child health while reducing carbon pollution.

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Questions for the Record

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THE HONORABLE KATHY CASTOR

1. In your testimony before the committee you mentioned some of the risks that farmworkers face from the impacts of climate change. What is the age distribution of these farmworkers and how does their age impact the risks that they face?

Overall, there are approximately 2.4 millionⁱ farm workers across the country, including hundreds of thousands of minors, ranging in number from 300,000ⁱⁱ to 500,000.ⁱⁱⁱ In terms of family structure, the majority of farm workers surveyed (55 percent) reported having minors in their household. In fact, although nationally-based surveys of farm workers^{iv} don't include children under the age of fourteen, in farmworker families, it is common for children to begin work alongside their parents at ages as young as 12.^v

Farmworkers are also relatively young, with two-thirds of the population (67%) under the age of 44:

- 14–19 years old (7%)
- 20–24 years old (11%)
- 25–34 years old (26%)
- 35–44 years old (23%)
- 45–54 years old (19%)
- 55–64 years old (11%)
- 65 years or older (4%)

Outdoor workers, children, adults over the age of 65, and low-income communities are among the most vulnerable to extreme heat.^{vi} For years, farmworker families have been on the frontlines of exposure to extreme heat and pesticides, a reality that we've underscored at the state and national level, and via Congressional testimony before the Energy and Commerce Committee,^{vii} the Education and Labor Committee,^{viii} and most recently, the Select Committee on the Climate Crisis.^{ix}

2. What are some of the challenges that farmworkers and rural communities face in protecting themselves from the impacts of climate change? Are the challenges unique to rural areas?

Roughly half of farmworkers are undocumented, most face language barriers and lack access to health care and employment benefits. On the economic front, farmworkers have a mean and median income that ranges from \$17,500 to \$19,999 for personal income, and from \$20,000 to \$24,999 for family income.^x These factors limit the ability of farmworkers to be adequately informed about occupational and environmental hazards, to speak out in the workplace or have access to timely medical attention when illness or injury strikes. Limited income also affects the affordability of housing and air conditioning that can provide refuge from extreme temperatures.

When it comes to pesticide exposure, every year, over 1.1 billion pesticides are applied in the United States. Climate change is expected to result in increased pesticide use. Farmworker women work while pregnant. Most farmworkers have minors in their households and that there are hundreds of thousands of minors who work in agriculture. When you consider that, there are serious health implications for all farmworkers but in particular, for farmworker children whose bodies and brains are still developing and could face irreparable harm and reduced IQs through prenatal, on the job, and take-home exposures to neurotoxic organophosphate pesticides.^{xi} Salinas, CA is one of the leading agricultural regions in the country and UC Berkeley's Center for the Health Assessment of Mothers and Children of Salinas (CHAMACOS) Study has been instrumental in shedding light on pesticide exposures among farmworker children.^{xii}

Indeed, some of these challenges are unique to rural and agricultural areas. Compared to urban areas, rural areas have higher concentrations of people that live in poverty and are more likely to have limited access to medical services and housing with air conditioning. And compared to urban areas, agricultural areas face greater exposure to pesticides.

As such, we urge members of Congress to consider the unique vulnerability of the agricultural workforce (both young and old) to climate change, the additional occupational and environmental hazards that farmworkers will face from the combined threat of rising temperatures and increased exposure to pesticides, and the national safeguards that will be needed to protect the people that feed us. In part, this will mean a national heat illness and fatality prevention standard, additional resources

to rural and agricultural communities, as well as cancelling the registrations of toxic pesticides and a shift to alternatives that don't threaten the health and development of children in agricultural communities, and across the country.

3. During your testimony you mentioned that farmworkers are on the frontlines of rising heat, wildfires and pesticide exposure. How does air pollution impact farmworker families and rural communities?

In addition to rising heat, wildfires and pesticide exposure, farmworkers are also on the frontlines of exposure to unhealthy air. The UFW Foundation and the United Farm Workers union serve communities located in the leading agricultural regions in the country and in states that are home to the largest number of farmworkers in the country, including California, Washington, Oregon and Arizona. Based on the 2017 Census of Agriculture, when it comes to farmworkers California (377,593), Washington (228,588), Oregon (86,240), and Arizona (24,648) rank first, second, fourth and thirty-first in the nation, respectively.^{xiii}

In addition to being home to largest number of farmworkers, all of these states are also home to some of the most polluted cities in the nation for ground-level ozone ("smog"), year round particle pollution, and short-term particle pollution, according to the American Lung Association.^{xiv}

Constant exposure to air pollution threatens the health, life expectancy and quality of life farmworker families and rural communities. While ozone pollution harms the lungs, particle pollution increases the risk of lung cancer, shortened life-expectancy, respiratory and cardiovascular problems.^{xv} When it comes to air pollution, the subpopulations that face a greater risk are both children and the elderly, as well those that are low-income and/or suffer from asthma, lung disease, cardiovascular disease or diabetes.^{xvi} We recognize that rising temperatures and extreme heat, facilitate the creation of ground-level ozone and the risk that air pollution causes to human health.

Furthermore, droughts facilitate the environment that is conducive to Valley Fever, a potentially deadly infection caused by a soil-borne fungus that thrives in dry soil. The Centers for Disease Control and Prevention shares that tens of thousands of cases of Valley Fever are likely to occur, many will go misdiagnosed because its symptoms can be confused with the flu and many patients aren't tested for the disease. The numbers indicate that new cases of this harmful fungal disease are concentrated in the San Joaquin Valley, a leading agricultural region in the country where most of California's farmworkers are located. Experts warn that climate change will expand the areas in the country that will be affected by Valley Fever.^{xvii}

Consistent exposure to rising temperatures, ground-level ozone, particle pollution, pesticides, and the soil-borne fungus that thrives in droughts underscores the importance of protecting farmworkers and agricultural communities from climate change.

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